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ABSTRACT

Integrated pest management (IPM) is a program of prevention, monitoring, and control that offers the opportunity to eliminate or drastically reduce hazardous pesticide use. IPM is intended to establish a program that uses cultural, mechanical, biological, and other non-toxic practices, and only introduces least-hazardous chemicals as a last resort, if at all. This publication is intended to inform school community members and activists, policy decision makers, and pest management practitioners, all of whom play critical roles in getting schools to implement effective IPM programs. The report provides comprehensive details of IPM programs by: (1) explaining what an IPM program is and why it is necessary; (2) highlighting 27 school districts and individual school IPM policies and programs; and (3) outlining the basic steps to getting a school IPM program adopted. (EV)

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Safer Schools

Achieving A Healthy Learning Environment Through Integrated Pest Management

A REPORT BY THE
School Pesticide Reform Coalition and Beyond Pesticides

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School Pesticide Reform Coalition

Learning Starts With A Healthy Environment

The School Pesticide Reform Coalition advocates for every child's and school employee's right to an environmentally healthy school. The Coalition works to protect children's and the general public's health by supporting nationwide grassroots action and focusing local, state, and national attention on the reduction and, where possible, the elimination of pesticide use at schools.

Beyond Pesticides coordinates the Coalition in order to bring local, state, and national activists together to enable strategic thinking and coordination of a multi-state effort to address school pesticide use.

The Coalition is made up of 24 groups including the Agricultural Resources Center (NC), Alaska Community Action on Toxics, Beyond Pesticides, Californians for Pesticide Reform, Center for Health, Environment and Justice, Environment and Human Health (CT), Environment California, Healthy Schools Network, Improving Kids' Environment (IN), IPM Institute of North America, Kids for Saving Earth, LocalMotion (MI), Maryland Pesticide Network, Mississippi 2020 Network, New Jersey Environmental Federation, New York Coalition for Alternatives to Pesticides, Northwest Coalition for Alternatives to Pesticides, Pennsylvania Clean Water Action, Safer Pest Control Project (IL), Texans for Alternatives to Pesticides, Toxics Action Center (MA), Vermont Public Interest Research Group, Virginia Health and Environment Project, and Washington Toxics Coalition. For more information about the Coalition, please contact Beyond Pesticides.

Beyond Pesticides

Beyond Pesticides, is a national, community-based organization of grassroots groups and individuals. Bridges environment, health, urban, and rural concerns to: (i) stimulate widespread education on the hazards of toxic pesticides, and the availability of effective alternative pest management approaches in the context of protecting the public's health; (ii) influence decision makers responsible for pest management to use safe methods through grassroots action; and, (iii) encourage the adoption of local, state, and national polices that stringently restrict pesticide use and promote alternative approaches that respect health and the environment.

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Introduction

By Kagan Owens, *Beyond Pesticides*

Photo by Jason Malinsky

The implementation of safer pest management practices that do not rely on hazardous pesticides has been achieved by 27 school districts and schools in 19 states highlighted in this report. Schools that have chosen to adopt safer pest management strategies, such as an Integrated Pest Management (IPM) program, use alternatives to the prevailing chemical-intensive practices because of the risk such practices pose to children and other school users' health. While many public health advocates do not like the term IPM because it is often misused by chemical-intensive practitioners, IPM was established as a program of prevention, monitoring, and control that offers the opportunity to eliminate or drastically reduce hazardous pesticide use in schools. IPM is intended to establish a program that utilizes cultural, mechanical, biological, and other non-toxic practices, and only introducing least-hazardous chemicals as a last resort, if at all. Increasingly, the principle of organic pest management, derived from organic agriculture, is being applied to characterize management practices that employ preventive methods and a discrete set of allowable materials. The elimination of toxic chemicals exposure is especially important because as U.S. Environmental Protection Agency (EPA) Administrator Christie Todd Whitman has stated, "Childhood exposure to pesticides is an environmental health risk facing children today."[1]

Safer Schools is intended to inform school community members and activists, policy decision makers and pest management practitioners, all of whom play critical roles in getting schools to implement effective IPM programs. This report provides comprehensive details of an IPM program by: (1) explaining what an IPM program is and why it is necessary; (2) highlighting 27 school districts and individual school IPM policies and programs; and, (3) outlining the basic steps to getting a school IPM program adopted.

School IPM is not a new approach to pest management. It is a concept that has been implemented in various communities, schools, and government facilities for decades. Although there are no federal laws regarding school pesticide use and pest management, there is pending federal legislation, the *School Environment Protection Act* (SEPA), which has been introduced in Congress and adopted by the U.S. Senate twice. There are also numerous state laws, local policies, resolutions, and resources that focus on the adoption of school IPM programs.

State School IPM Laws

California	Recommends
Connecticut	Recommends
Florida	Requires
Illinois	Requires
Kentucky	Requires
Louisiana	Requires
Maine	Requires
Maryland	Requires
Massachusetts	Requires
Michigan	Requires
Montana	Recommends
New Jersey	Requires
New York	Recommends
Pennsylvania	Requires
Rhode Island	Requires
Texas	Requires
West Virginia	Requires

Currently there are 17 state laws that recommend or require schools to adopt an IPM program. In addition, 315 school districts and five individual schools have voluntarily adopted an IPM policy where no law mandates such programs, according to the recent Beyond Pesticides report, *Are Schools Making the Grade?* There are an additional nine states, including Hawaii, Indiana, Oklahoma, Minnesota, Nebraska, South Carolina, Tennessee, Washington, and Wisconsin, that have developed materials to facilitate schools' implementation of IPM programs, even though there is no state law. EPA has also developed guidance materials and encourages school officials to adopt IPM practices.[2]

The National Parents and Teachers Association passed a resolution in 1992 urging the adoption of school IPM programs "at the federal, state and local levels to eliminate the environmental health hazards caused by pesticide use in and around schools and child care centers. These efforts will result in cost-savings when use of chemical controls is reduced; decreased health risks; and safer school and child care center environments." The position statement also asserts, "Expansion of integrated pest management policies in schools and child care centers is an excellent long-term solution for control of pests that will significantly lower children's exposure to harmful chemicals by using the least-toxic mix of pest control strategies."[3] (See Appendix C for a copy of the resolution.)

With the adoption of school IPM policies and laws spreading across the nation, understanding how these programs take shape and the approaches used by schools and districts, as well as hurdles they had to overcome, are important to successful implementation. There are many success stories around the country that, like the 27 case studies included in this report, legitimize and illustrate the success and satisfaction nationwide. These stories show that IPM has:

- significantly reduced, and in some cases eliminated, the amount of pesticides used;
- is cost effective; and,
- yields better pest control results.

Children's Exposure to Toxic Pesticides

"Particular uncertainty exists regarding the long-term health effects of low-dose pesticide exposure," states the American Medical Association's Council on Scientific Affairs. "Considering these data gaps, it is prudent... to limit pesticides exposures ... and to use the least toxic chemical pesticide or non-chemical alternative."[4]

The vulnerability of infants and children to the harmful effects of pesticides has attracted national attention. EPA, the National Academy of Sciences, and the American Public Health Association, among others, have voiced concerns about the danger that pesticides pose to children. Children face higher risks than adults from pesticide exposure due to their small size, tendency to place their hands close to their face, engaging in activities on or near the ground, greater intake of air and food relative to body weight, developing organ systems, and other unique characteristics.

Adverse health effects, such as nausea, dizziness, respiratory problems, headaches, rashes, and mental disorientation, may appear even when a pesticide is applied according to label directions. Pesticide exposure can adversely affect a child's neurological, respiratory, immune, and endocrine

Because most of the symptoms of pesticide exposure, from respiratory distress to difficulty in concentration, are common in school children and may also have other causes, pesticide-related illnesses often go unrecognized and unreported.[9]

system,[5] even at low levels.[6] A recent study found organophosphate pesticides cause genetic damage linked to neurological disorders such as attention deficit hyperactivity disorder and Parkinson's disease.[7] Several pesticides, such as pyrethrins and pyrethroids, organophosphates and carbamates, are also known to cause or exacerbate asthma symptoms.[8] Because most of the symptoms of pesticide exposure, from respiratory distress to difficulty in concentration, are common in school children and may also have other causes, pesticide-related illnesses often go unrecognized and unreported.[9]

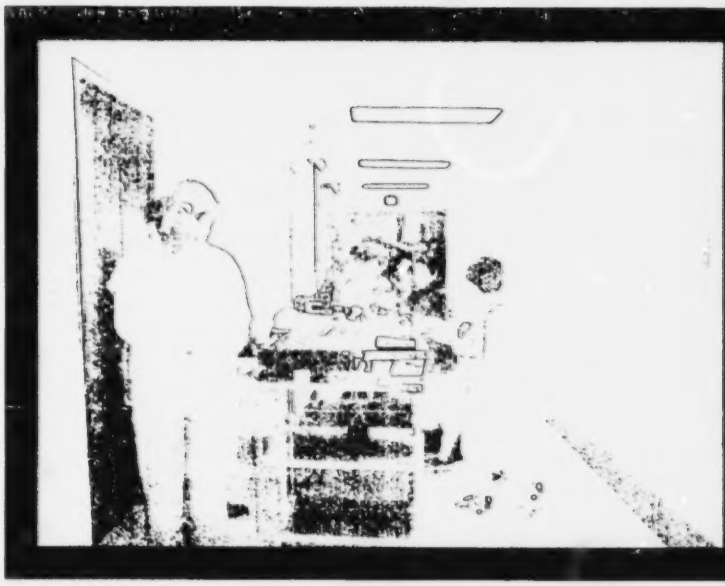
Studies show that children living in households where pesticides are used suffer elevated rates of leukemia, brain cancer, and soft tissue sarcoma.[10] According to EPA's Guidelines for Carcinogen Risk Assessment, children receive 50 percent of their lifetime cancer risks in the first two years of life.[11]

In 1999, the National School Boards Association along with the National League of Cities and Youth Crime Watch of America stated that "dangers in the environment" such as "potentially dangerous pesticides" are one of the "10 critical threats" that jeopardize "the health, safety, and future of America's children."

During any normal school day, children and school personnel can be exposed to hazardous pesticides. Pesticide exposure at school can occur whether applications are made before children enter the building or while they are present. Chemicals fill the air and settle on desks, counters, shades, and walls. Children and staff breathe in contaminated air or touch contaminated surfaces, unknowingly exposing themselves to residues that can remain for days and sometimes break down into other dangerous compounds or contain so-called "inert" ingredients that are not disclosed on the product label but could be highly hazardous.

School Pest Management

Schools frequently provide an inviting habitat for pests. School facilities that have not properly sealed potential pest entry points or



new construction that creates a pest habitat can result in pest problems. As facilities age, their susceptibility to pest invasions increase and established pest populations tend to expand. Infestations may indicate deficiencies in sanitation or structural disrepair. Cockroaches find good food stuffed away in forgotten lunch bags, cafeterias, and bathrooms. Weeds that prefer compacted soils out-compete native grasses on school athletic fields. Fortunately, learning to solve pest problems without chemical dependency is based on a common-sense approach.

Most insect and weed pests may be a nuisance, or raise aesthetic issues, but do not pose a threat to children's health. The public is increasingly calling into question the use of pesticides for cosmetic results alone.

The 27 districts and school IPM programs highlighted in this report are examples of success stories that should be followed by all school districts, public and private, and childcare facilities throughout the nation. The IPM policies in more than 4,500 U.S. school districts documented in *Are Schools Making the Grade?* do not ensure effective IPM implementation. *Safer Schools* tells the story of how to implement these policies and provide a guide for new policies and programs to be adopted.

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An In Depth Look at Integrated Pest Management (IPM)

By Kagan Owens, *Beyond Pesticides*

Photo by Jason Malinsky

IPM is a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of practices such as regular pest population monitoring, site or pest inspections, an evaluation of the need for pest control, occupant education, and structural, mechanical, cultural, and biological controls. Techniques can include such methods as sanitation, pest-proofing waste disposal, structural maintenance, good soil health, and other non-chemical tactics. Least-hazardous pesticides should be selected only as a last resort, thus minimizing the toxicity of and exposure to pesticide products that are used.

A good IPM program can eliminate the unnecessary application of synthetic, volatile pesticides in and around schools. Do not think that without toxic pesticides, disease-carrying pests and weeds will overcome school buildings, fields, and landscapes. As the stories in the report illustrate, this is simply not true. A school IPM program can effectively and economically prevent and manage pest problems without hazardous pesticides and without letting pests run rampant.

A key to cutting pest management costs is to look for long-term solutions, not temporary control, when addressing a pest problem. Pesticides do not solve the problems that have created the pest-friendly environment, they only treat the symptoms of an infestation. They are often ineffective over the long-term, and the most common pests are now resistant to many insecticides, as are weeds resistant to herbicides.[12]

IPM is a term that is used loosely with many different definitions and methods of implementation. Beware of chemical dependent programs masquerading as IPM. For example, the pest control contractor in one school district in Indiana claimed to be implementing an IPM program. In fact, this was not the case and pesticides were applied whether pests were found or not.

An IPM program should prohibit:

- Pesticides that are carcinogens,[13] acutely toxic,[14] endocrine disruptors, reproductive and developmental toxins,[15] neurotoxins,[16] immunotoxins,[17] and respiratory toxins.
- Pest management decisions based on aesthetics alone;
- The application of pesticides on a routine basis, whether pests are present or not;
- The application of pesticides while the area is occupied or may become occupied during the 24 hours following the application; and,
- The application of pesticides by fogging, bombs, or tenting or by space, broadcast, or baseboard spraying.

For example, the case studies in this report show a series of prohibitions that seek to stop the use of specific hazardous pesticides or application methods, including the following: the Los Angeles Unified School District, CA (LAUSD) halted the use of broadcast spraying and the use of pesticide bombs; the Boulder Valley School District, CO (BVSD) pest control operator does not use *any* toxic synthetic pesticides indoors; Montgomery County Public Schools, MD moved away from relying on Dursban, diazinon, and pyrethrum; Evesham Township School District, NJ has eliminated organophosphate, carbamate, and solvent-based pesticides from use in buildings; and, the New York City Public Schools, NY (NYCPS) have eliminated spray and fogging pesticide applications. Anchorage School District,

AK (ASD) and Baldwin Union Free School District, NY (BUFSD) have specifically banned the use of pesticides for aesthetic purposes.

An IPM program allows low hazard pesticides, such as boric acid and disodium octoborate tetrahydrate, diatomaceous earth, nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only, microbe-based insecticides, botanical insecticides (not including synthetic pyrethroids) without toxic synergists, biological control agents, and materials for which the inert ingredients are nontoxic[18] and disclosed, as a last resort.

Six IPM Program Essentials

An IPM program is made up of six essential components, which together create an effective program. The following are brief descriptions of the IPM components and examples taken from the 27 case studies highlighted in this report.

① **Education.** Education, in the form of workshops, training sessions, and written materials, is an essential component of an IPM program, including administrators, maintenance personnel, cafeteria staff, nurses, teachers, parents, and students.

Training school staff at LAUSD is taken very seriously. William Currie, with International Pest Management Institute, has developed 28 different training curricula depending on the target group. Irving Independent School District, TX (Irving ISD), through Texas A&M extension, provides IPM training twice a year for all maintenance and custodial staff, and once a year for all principals.

Some schools have come up with inventive ways to educate and involve teachers and students. For instance, the West Ottawa Public Schools, MI conduct periodic advertising of their program in area newspapers and performs educational skits on the schools' cable access channel. Lewis Cass Technical High School, MI (Cass Tech) uses artwork projects, educational pamphlets and presentations to involve students in their IPM program. Science curriculum is another excellent way to educate the students about insects and

Integrated Pest Management (IPM) Defined

IPM is a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of practices such as:

- regular pest population monitoring;
- site or pest inspections;
- an evaluation of the need for pest control;
- occupant education; and,
- structural, mechanical, cultural, and biological controls.

Techniques include such methods as:

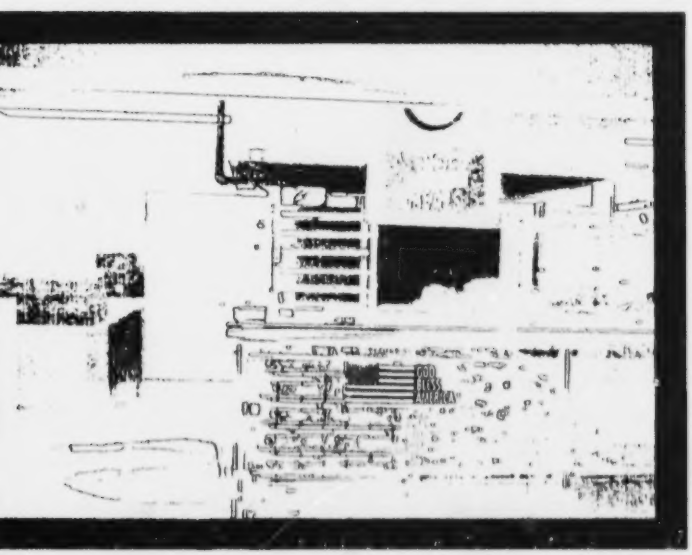
- sanitation;
- pest-proofing waste disposal;
- structural maintenance;
- good soil health; and,
- other non-chemical tactics.

Least-hazardous pesticides should be selected only as a last resort, thus minimizing the toxicity of and exposure to any pesticide products that are used.

plants (weeds) and involve them in IPM, as is done in the Kyrene School District, AZ and Cass Tech.

② **Monitoring.** Monitoring helps identify the nature and extent of a pest problem. This includes regular site inspections and pest trapping to determine the types and infestation levels of pests at each site. Monitoring the school for pest problems and inspecting the buildings and lawns regularly allows pest managers to properly identify and manage a pest problem before a serious outbreak occurs. Monitoring can also help establish possible causes of the pest problem, such as leaky pipes, food crumbs, cracks in walls or around plumbing, or drought-stressed plants. It is not necessary for the entire school to be monitored, just those areas with the potential for a pest problem, leaving the other areas to be monitored and managed on a complaint basis. A pest logbook is essential to a monitoring program. It allows anyone in the school to document a pest sighting, which enables school-wide communication about potential pest problems.

An inspection checklist with daily, weekly, and monthly tasks is provided to all school custodians and maintenance personnel at the Sherborn Public Schools, MA to help its IPM program run efficiently. The Montgomery County, MD schools divide each school facility into monitoring zones. The primary zone is made up of areas associated with the storage, preparation, and consumption of food and is inspected more frequently than the other zones.



Monitoring traps should be checked weekly, according to the Broad Ripple High School, IN and Albany City School District, NY IPM programs, and site and pest inspections (whether or not a problem is identified) should be reported monthly, according to LAUSD and Broad Ripple High programs. Besides inspecting the buildings and grounds for potential pest problems, Montgomery County, MD schools and Monroe County Community School Corporation, IN (MCCSC) find that inspecting incoming and outgoing food and supplies is critical as well.

Student involvement in the school's monitoring program can save money, as is the case at Kyrene schools and Cass Tech. Students at Cass Tech work with the building engineers and maintenance staff to fix problems they identify, through site inspections and pest monitoring.

③ **Pest Prevention.** Non-chemical pest prevention is the primary IPM strategy. Habitat modification that reduces or eliminates sources of food, water, shelter, and entryways, as well as the maintenance of healthy lawns and landscapes, are key. Schools can prevent pest problems through proper sanitation and housekeeping, pest-proofing waste disposal, structural maintenance, good soil health, and other long-term, non-chemical strategies. (For specific pest prevention strategies used by the 27 districts and schools highlighted in this report, see the section titled "IPM Implementation Techniques" on page 9.)

④ **Least-hazardous Approach to Pests.** The first approach to controlling a pest outbreak should be to improve sanitation, make structural repairs, and use biological, physical, and mechanical controls such as screens, traps, vacuuming, and weeders. If a mixture of non-toxic strategies is shown to be inadequate, a least-hazardous chemical and application method may be used as a last resort. As the ASD policy states, the selection of the pesticide should be:

- least hazardous to human health;
- least disruptive of natural controls and to non-target organisms;
- least damaging to the school and natural environment; and,

- most likely to produce long-term reductions in pest control requirements.

The types of pesticides used by the schools in this report include products containing boric acid, fatty-acid soap, pheromones, insect growth regulators, and nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only. In addition to those, BVSD IPM practitioner has success using basic

At CPS, a school pilot IPM program was shown to be successful before the program was extended to the rest of the District. The pilot program was proof that IPM works, even in schools that are deteriorating and prone to pest problems.

hand soap, household vinegar, and orange peel extract as his weapons of choice against pest problems. Cass Tech uses nematodes and parasitic wasps. LAUSD also reports using hand soap as well as enzyme-based cleaners for insect management. For weeds, LAUSD uses Bioganic™ weed killers that contain clove oil as the active ingredient. Corn gluten meal was used as a pre-emergent herbicide at the Carl Sandburg Elementary School, WA and diatomaceous earth was used as an insecticide at the Bainbridge Island School District, WA (BISD).

All pesticides are poisons designed to harm living organisms and should be handled carefully. Applicators must wear proper clothing, gloves, a filter mask and other protective gear appropriate to the material being applied.

⑤ **Pesticide Use Notification.** Hazardous pesticides are rarely, if ever, needed in a true IPM program. But in those cases where they are used, school staff and parents have a right to be informed. Notification is especially important for people who are sensitive to chemicals because they can become extremely ill from exposures to very low levels. Laws in 21 states require anywhere between 24 and 72 hour prior written notification of a school pesticide application and 28 states require that notification signs are posted for a school pesticide application. (See Appendix D for a list of states, districts, and schools and their pesticide and pest management requirements.)

⑥ **Record-Keeping.** A record-keeping system is essential to establish trends and patterns in pest outbreaks. Information recorded at every inspection or treatment should include pest identification, population size, distribution, recommendations for future prevention and complete information about the action taken, including the use of any pesticide. A student-assisted IPM program, like that at Cass Tech, can help provide excellent and meticulous reporting and documentation of control tactics and the results.

Facts From the Field: What the Stories Reveal

The 27 case studies highlighted in this report tell a lot about getting an IPM program started and implemented. These are real life experiences that are instructive for all schools and other entities.

Major School Pest Problem Areas. According to the stories in this report, areas where food is prepared and/or consumed, such as the kitchens, cafeterias, and staff lounges are the primary problem areas. Other areas with increased pest problems include garbage cans and dumpsters, custodial and teacher closets, bathrooms, recycling areas, clothing donation boxes, athletic fields, school pets, and indoor plants.

Extent of the School IPM Program. The argument that IPM cannot be successfully implemented on a large scale or that it is too resource consuming for an individual school is debunked in this report. The case studies highlighted in this report represent a range of

program sizes from the three largest school districts in the continental U.S. (NYCPS, LAUSD, and Chicago Public Schools), to medium sized school districts like Irving ISD, to small school districts that have just five schools like Sherborn, to individual schools like Cass Tech and Sandburg Elementary.

Catalyst for Change. Implementation of an IPM policy and program may be brought about by an individual, group, or event that spurs the school or district to move away from their conventional pesticide spray program. The stories highlighted in this report are no different. Change in practices is the result of either individuals and organizations working from outside the school system, creating public pressure, or school employees working from inside the school system. In many cases, external and internal pressures work together.

The following are examples of strong organizing efforts by parents and local activist groups described in this report:

- A local organization worked with a youth activist group and discovered, through a state Freedom of Information Act request, that toxic pesticides were being used at Anchorage schools;
- A parent's sons were exposed to a pesticide at an LAUSD elementary school, triggering one of them to have an asthma attack;
- With a new state law that required schools implement IPM if financially feasible, a local activist organization created public pressure and developed a pilot project to prove it was cost effective for the entire Chicago Public Schools (CPS) system;
- A pesticide misapplication at Broad Ripple High made students sick, triggering parents to take a closer look at the school's pest control program;
- The local PTA worked with Triadelphia Ridge Elementary School, MD (TRES) to implement a "pesticide-free" pest management program;
- Parents and a statewide organization created public pressure and made repeated requests to the Evesham Township schools;
- Parents approached the Locust Valley Central School District, NY (LVCSD) board out of concern about the school's pesticide use and children's health issues;
- When a parent heard of a neighbor's child getting sick after his school used an insecticide bomb in his classroom and then saw a pest control company spray pesticides at her child's Pitt County Schools, NC, school, she was worried about the students' chemical exposure and demanded a change;
- Two local organizations worked together to create a student-run landscape project at Spencer Butte Middle School, OR (SBMS);
- A parent learned that Sandburg Elementary was using toxic herbicides heavily on school property; and,
- After a devastating chemical exposure incident from a renovation project at BISD, parents and community members making school environmental health a priority set the stage for safer pest management practices.

The following are examples of school pest managers or someone from inside the school system advocating for change in pest management practices that are described in this report:

- A university professor working with MCCSC received EPA funding to create a model pilot project that was later extended to other school districts in other states, including Auburn City Schools, AL and Kyrene schools;
- A local pest control contactor with BVSD, Princeton City School District, OH, and Broad Ripple High made a push for the schools' IPM program;
- Albany school's superintendent attended an IPM conference and learned of the benefits to IPM;
- The person in charge of pest management at West Ottawa schools learned about pesticides' impact on children;
- A Cass Tech teacher and the state Department of Agriculture worked together to start a student run IPM program;
- The effort to switch to IPM was pioneered by the Montgomery County Public Schools, VA staff that oversees pest management;

- School administrators, nurses, custodians, and other South Burlington School District, VT staff voiced concern about pest control practices at a school safety committee meeting;
- Learning that students were having reactions to chemicals used at Irving ISD, along with a new state IPM law, motivated District staff in charge of pest management to look closely at IPM implementation; and,
- The New York Attorney's General report *Pesticide Use at Schools: Reducing the Risk* spurred BUFSD's already health conscious Indoor Air Quality Team to implement IPM.

Resistance and Skepticism to IPM. Common to many of the 27 case studies is initial resistance on the part of school occupants to behavioral changes required for a successful IPM program. There is generally early skepticism among school staff, primarily custodians, about the efficacy of non-toxic and least-hazardous IPM strategies. Many school staff and pest management practitioners agree that IPM can be challenging at the beginning, when pest levels are high. However, changes in these attitudes lead to successful IPM programs.

The Kyrene case study points out school staff and faculty concerns regarding the cost of the IPM program and increased workloads. At West Ottawa schools, the transition to an IPM program was not smooth because there was some resistance. At BVSD, a school principal expressed doubt that wasps could be controlled without a synthetic pesticide.

In the end, these case studies show that IPM can be effectively and efficiently implemented across the country. At CPS, a school pilot IPM program was shown to be successful before the program was extended to the rest of the District. The pilot program was proof that IPM works, even in schools that are deteriorating and prone to pest problems. "It is important to remember that there is going to be a transition period when starting an IPM program. School staff are going to have to make some changes," states Jerry Jochim, IPM coordinator at MCCSC. "But after that, it becomes normal, routine. IPM may even be less work."

IPM Implementation Techniques. As the case studies iterate, once the IPM approach is understood, it is as "easy as falling off a log," according to Kyrene. Successful implementation of IPM is based on altering the elements that lead to pest problems: entry, food, water, shelter, and stressed, non-native lawn and landscapes. Schools highlighted in this report rely on the following steps, which result in a decrease or elimination of pest problems and prevent future outbreaks from occurring. (For additional implementation strategies, see Appendix E for a list of pest prevention strategies or *Building Blocks for School IPM: A Least-toxic IPM Manual* for prevention and specific pest control strategies, available from Beyond Pesticides at www.beyondpesticides.org.)

Entry Restrictions:

- Caulk or otherwise seal any cracks and crevices and any potential pest entry points;
- Install door sweeps on building perimeter doors;
- Install screens on all intake/outlet ports around the school building to keep wasps and bees out;
- Repair or install window screens; and,
- Install air doors on any doors accessing the kitchen from the outside.

Sanitation Strategies:

- Use heavy-duty trash bags which will lead to less cleaning of the cans;
- Store food properly and in air tight containers;
- Deep clean kitchens twice to three times a year;
- Remove garbage more frequently and steam clean garbage cans as needed;
- Use enzyme-based cleaners to remove pests' pheromones left on surfaces and/or use enzyme-based cleaners containing peppermint oil to deter pests;
- Use citronella beads in dumpster to repel pests like bees;

- Refrigerate trash and recycle rooms;
- Move dumpsters away from building; and,
- Use metal containers for storage of food and supplies in the classrooms.

Shelter Modifications:

- Do not store boxes or products directly on floor and use shelving made of metal;
- Eliminate the storage and/or use of cardboard boxes; and,
- Clear storage areas of unused materials.

Lawn and Landscape Maintenance:

- Use string trimmers to mechanically manage weeds;
- Prune trees and shrubs and cut back flowers;
- Apply mulch to suppress weeds;
- Manually weed at least three times per season;
- Overseed and fertilize athletic fields annually to promote growth to keep weeds out;
- Use weeders;
- Plant native vegetation that will be better apt to tolerate local climate plants;
- Use compost;
- Install an irrigation system;
- Dethatch lawn and aerate soil;
- Seal sidewalk cracks;
- Flame weed, which works well for weeds around portable classrooms, and in sidewalk cracks and gravel; and,
- Use herbicidal soaps and corn gluten meal.

Specific Pest Control Strategies:

- Vacuum **small insects** found in the building and place baby powder in the vacuum cleaner to instantly kill the insects;
- For **crawling insects and small rodents**, use glue traps or glue boards;
- For **rodent** control, use sharp traps;
- For **rodent and gopher** control, have woodwork classes build owl boxes;
- For **wasp and bee** control, use jar traps like the Oak Stump Farm Trap;
- For **bee and wasp nests**, use hot soapy water and remove manually. One suggestion is to attach a scraper on a long pole for removing the nests;
- For **ant** control, use soapy water to kill them on contact and caulk holes;
- For **geese** control, a border collie can effectively chase them away;
- For **bagworm** control, use red spider mites, herbicidal soap and prune;
- For **cockroaches**, use sticky traps and modify their habitat by fixing leaking pipes that provide moisture they are attracted to;
- For **pigeons**, place decoys at appropriate locations; and,
- For **termites**, use nematodes.

IPM Effectiveness. The ability to implement an effective IPM program that controls pest problems while decreasing or eliminating pesticide use is captured by the 27 case studies in this report. As Joseph Tobens of Evesham says, "Rarely is there a need to apply pesticides inside our buildings or on school property." General statements reflect the effectiveness of IPM programs, including LAUSD's finding that there has been "a significant reduction in pesticides used" and the "general satisfaction" experienced by CPS. The case studies report that:

- Pesticide use decreased by 85 percent in Auburn schools;
- Pest problems reduced by 85 percent and pesticide use reduced by 90 percent in Kyrene schools;
- Since the first day of implementing BVSD's indoor IPM program, no synthetic pesticides are used and no returning pest problems have occurred;
- Pest problems decreased by 90 percent in MCCSC;
- Since the program started in Montgomery, MD schools, pesticides use has been reduced every year. In the past two years, pesticides have been used only five times;
- In the eight years of its IPM program, Evesham schools have only used chemical pesticides twice; and,

- Pesticide use decreased over 90 percent and service calls have reduced by 95 percent in NYCPS.

IPM Implementation Hurdles. Schools have successfully faced hurdles that center on the following issues:

- Due to budget and staffing restraints, Kyrene schools anticipate IPM implementation from the three pilot schools to the entire District to take at least five years;
- The Illinois state IPM law exempted school districts that requested to opt out of IPM requirements if the district claimed it would be too costly. Activists worked with individual schools in CPS to prove that IPM was cost effective;
- The person designated as the IPM coordinator for MCCSC originally knew very little about pests or pest management. After learning about IPM and its simplicity, the coordinator now provides trainings throughout the country;
- For West Ottawa schools, weeds on the school grounds are the largest hurdle the District faces in implementing an IPM program and are now working to identify successful outdoor IPM strategies;
- The TRES case study states that IPM is labor intensive and that it would help to have more staff. Their lawn and landscape program is partly run by parent volunteers to help with the program;
- Costs of implementing certain preventive control measures like door sweeps and structural repairs are not within Albany schools' budget, and thus some buildings do not get what they need for an optimal IPM program immediately. These components will be implemented over time;
- Poison ivy is a major problem for LVCSD which is researching effective non- and least-toxic approaches;
- The Health Department cites NYCPS if insects are found in the monitoring traps in school kitchens and are therefore penalized for using IPM. As a resolution, now the building staff check the monitoring traps and immediately discard any with insects, yet they lose valuable information the traps provide;
- For the staff at BISD, to maintain grounds so they remain aesthetically appealing with limited resources for manual labor was difficult. Their solution is to use native plantings and high-maintenance areas, such as thinly planted shrub beds, are minimized; and,
- The parent run volunteer program at Sandburg Elementary has had some difficulty with recruiting and maintaining a volunteer effort on a long-term basis, which takes persistence and dedication to keep the program going.

Cost Benefits. The cost of implementing an IPM program is not an impediment to moving IPM forward. Depending on the school's current maintenance, sanitation, and pest management practices, some economic investment is usually required at the outset of an IPM program. Short-term costs may include IPM training, purchasing new equipment, hiring an IPM coordinator or making preliminary repairs to buildings. Activities that can be absorbed into a school's existing budget include training of maintenance, cleaning, and food service staff and educating students and teachers to modify their behavior. In addition, some school maintenance and structural repair funds may already be budgeted for activities such as replacing water-damaged materials, landscaping, waste management, and physical barriers. Generally, much of the costs that were allocated to chemicals go to labor in an IPM program.

Monitoring is critical to reducing pest management costs because it helps pest managers determine if, when, and where pest populations warrant action and therefore requires more precise pest management approaches. Monitoring can also help determine if damage thought to be caused by pests is actually caused by other factors like poor drainage or leaky pipes.

The fact that pest control is not often a large part of the school's budget should not hinder the school's transition to an IPM program. Certain facets of an IPM program can be implemented

over time in order to keep costs down. Locust Valley passed a bond to replace windows, which helped implement components of its IPM program, while keeping costs for pest management at a minimum.

While not always specified, the case studies generally show that IPM costs are equal to, or more often, less than a conventional pesticide spray program. The following specifics were reported on the cost benefits:

- After an initial investment in maintenance, the long term costs associated with pest management decreased for Auburn schools;
- Since the IPM program began, the cost of pest management has been cut in half to $17,000 annually at MCCSC;
- IPM saved West Ottawa schools $10,000 annually on their pest management;
- Pesticide related expenses have decreased 20 to 25 percent at Baldwin schools; and,
- The herbicide-free project at Sandburg Elementary began with just $165, which the District used on its previous program, along with minimum funds from the District and PTA groups that were used for purchasing new supplies and now, almost four years later, is "almost free to maintain."

Volunteer Programs. Although seen mainly on the individual school level, several successful IPM programs rely on volunteers, such as the student run structural IPM program at Cass Tech and SBMS landscaping project or parent run pesticide-free lawn and landscape projects at TRES and the Sandburg Elementary. These programs not only educate the school community about IPM, but also help reduce costs.

Keys to IPM Success. Most of the 27 case studies featured in this report highlight one or two key elements that contributed to an effective school IPM program. These lessons from the field can be incredibly valuable to those starting or already implementing an IPM program. The two most commonly stated keys to success are: (1) to organize with a wide-range coalition of community groups and individuals including student groups, parents, teachers, medical community, local activists, among others in support of school IPM; and, (2) to establish an IPM committee to oversee program implementation. Additional elements of success include:

- Training from people who are knowledgeable about IPM strategies;
- Participation of custodians, school staff and/or students in implementation strategies;
- Have an IPM advocate, whether it is a custodian, an administrator or board member within the school system, help keep the integrity of the program in place;
- Create a group of volunteers to help with the IPM program;
- Amend the school's pest management contract specifications to reflect IPM practices;
- Adopt a written IPM policy to guide the program; and,
- Develop the cooperation and support of school officials.

Conclusion

Many people assume that schools are environmentally safe places for children to learn. It often takes a pesticide poisoning, repeated illnesses or a strong advocate to alert a school district to the acute and chronic adverse health effects of pesticides and the viability of safer pest management strategies. IPM has proven to be a vital tool to reducing student and school staff's exposure to hazardous pesticides. The 27 case studies represented in this report prove that IPM can be successfully implemented to manage school pest problems, and significantly reduce or eliminate pesticide use. This report is a guide for those looking to implement a successful school IPM program. For additional information after reading the case studies, see the Appendix for local organizational contacts.

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Alabama

Auburn City Schools

By Fudd Graham, Ph.D., *Alabama Fire Ant Management Program* and Nancy Golson, Ph.D., *Dean Road Elementary*

Catalyst for Change

The way Auburn City Schools viewed pest management changed when three schools in the District became part of a pilot project on school IPM, utilizing the experience of the Monroe County Indiana Community Schools Corporation (MCCSC). The pilot was funded by EPA and spearheaded by Indiana University in cooperation with a local pest control company.

Implementation Strategies

The first year of the project involved local training, monitoring, general support for the schools and making pesticide application decisions. Cleanliness and sanitation were emphasized to create an environment that would not be an open invitation to pests. Custodians, teachers, and cafeteria workers had to join the team to create a place where pests were not welcome.

At first, all were skeptical but committed to eliminate pests and pesticides as much as possible for the good of the students. A change in behavior was required. Some custodians thought that the project's sole purpose was to create work for them. Once they realized that some of the suggestions saved them time (e.g. heavier duty trash bags result in less cleaning of trash cans) and allowed them to do a better job, they became valuable assets in monitoring the schools and pointing out problems. Others already kept their school in great shape and were assets from the start. Teachers and cafeteria workers had to "stop inviting bugs" in the ways they stored food and cleaned the classrooms and kitchens.

IPM Effectiveness

Pesticide applications in the three pilot schools were reduced over 85 percent and are now targeted to problem areas using low impact formulations, such as baits. Fewer pests are now found in the schools and infestations are stopped before they have an opportunity to expand. As a result, children have less exposure to both pests and pesticides.

The results were so astonishing that all the schools in the District wanted to become IPM schools. One school with a major localized mouse and German cockroach problem changed their pest contract to become an IPM school. Their company used basic IPM principles and got the problems under control. The IPM approach worked, and worked well.

The benefits to the children in Auburn City Schools are tremendous. They now are in a system that no longer "invites the bugs" and has reduced pesticides in their schools.

Cost Benefits

Costs to the PCO and to the school system increased during the initial stage of the IPM program, because the schools initially have to make an investment in maintenance. However, once the program is up and running, the costs are actually reduced for both. The cost of pesticides is now replaced by the cost of monitors and baits, as needed.

Key to Success

The presence of an activist in the system is an asset. One school principal has been a supporter of the program since the initial meeting and instrumental in maintaining the integrity of the program. Another principal helped to get necessary maintenance projects completed.

Success Expansion

As the program expands throughout the Auburn City School system, a private school in Auburn has also committed to IPM. Three schools in the Pritchard School System in Mobile County were recently invited as pilot projects to also declare, "BUGS ARE NO LONGER INVITED" thanks to IPM.

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Alaska

Anchorage School District

By Pamela K. Miller, *Alaska Community Action on Toxics*

Catalyst for Change

In the spring of 1999, at the request of a concerned teacher and parents of students in the Anchorage School District (ASD), Alaska Community Action on Toxics (ACAT) filed a Public Records Act request to determine the extent of pesticide use in Anchorage schools. ASD had no system of notification to parents, students or teachers. The research of the requested records revealed that the District made frequent scheduled applications of harmful pesticides. ACAT teamed up with the Alaska Youth for Environmental Action (AYEA), local teachers, doctors, and other activists to demand ASD cancel its annual district-wide August spraying of carbaryl, a widely used insecticide with many adverse health effects, and review their pest management program that relied heavily on chemical treatments.

Safer Policy Adopted

Over the next year, ACAT, parents, and teachers presented testimony before the Anchorage School Board and a series of meetings were organized with the superintendent and his staff to develop a protective policy. In February 2000, the Anchorage School Board voted unanimously to end the use of toxic chemicals in local schools by endorsing a new least toxic pest management policy and pest control plan.

The precedent-setting policy bans the use of pesticides except in cases where pests threaten health and safety. Pesticides cannot be used for aesthetic or nuisance purposes. The policy states, "If pesticides are used, the ASD will use the least toxic formulation with the least potential for human exposure. Further, no chemical is permitted for use if it is acutely toxic or proven to cause cancer, hormone disruption, reproductive damage, or nervous system toxicity. The ASD will apply the precautionary approach in all pest management decisions to prevent harm to human health and the environment from the use of toxic pesticides that have not been fully tested." Before a pesticide can be used, notification of parents, teachers, and students is required.

"Our new policy promotes a healthy and safe school environment for students and staff. We will use non-chemical measures first, with pesticides used only as a last resort and with parental notification," said ASD Superintendent Carol Comeau.

Implementation Strategies

The ASD plan emphasizes educational, physical, mechanical, and biological measures of prevention as a priority over chemicals. The pest management procedures for implementation of the policy require the following guidelines:

- least disruptive of natural controls;
- least hazardous to human health;
- minimize negative impacts to non-target organisms;
- least damaging to the school and natural environment; and,
- most likely to produce long-term reductions in pest control requirements.

Cost Benefits

The ASD policy is cost effective and it works because it uses preventive maintenance such as better cleaning, food storage, and caulking.

Success Expansion

Following the success with ASD, ACAT requested that the State of Alaska adopt a statewide policy requiring notification and least-toxic pest management in all schools, including day-care facilities and universities. In October 2001, the Alaska Department of Environmental Conservation implemented new regulations on the use of pesticides in state and private schools. ACAT is requesting broader application of these notification requirements to include: licensed day care facilities, assisted living homes, universities, hospitals, public buildings/grounds, parks, and camps. In addition, ACAT is working to strengthen notification provisions, record keeping, disclosure of environmental and health effects, and a requirement, rather than discretionary provision, for least-toxic pest management.

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Arizona

Kyrene School District

By Dawn H. Gouge, Ph.D., *University of Arizona*, Carl J. Martin, *Arizona Structural Pest Control Commission*, and Kirk A. Smith, Ph.D., *University of Arizona*

Catalyst for Change

With EPA funding and the support of the District's facilities manager, a pilot program was launched in 2000 to develop a Monroe County, Indiana style model school IPM program in three District schools.

Implementation Strategies

An initial pest audit of the three schools' grounds and buildings was conducted to ascertain the extent of the pest problems. Based on the findings, a prioritized prescription was written for each of the pilot schools. Initially, the program received a skeptical reception since school faculty and staff had concerns regarding costs and increasing workloads.

As the year progressed and training classes ensued, the awareness and understanding of IPM increased. People at all levels began to embrace the program. Science teachers conducted classes on bugs with help from the IPM team. Students collected bug data from monitoring traps. Woodwork classes built owl boxes to house barn owls (gopher and rodent control volunteers) on the school grounds. A local IPM expert was instrumental in getting the District's cooperation to help fund several of the identified structural and maintenance issues.

IPM Effectiveness

After one year the pilot program was concluded. Information was compiled regarding the number of pests trapped with the monitoring traps and the amount of chemical pesticides used. The pilot program resulted in an 85 percent reduction in pests and, more significantly, a 90 percent reduction in the amount of chemical pesticides applied. The program has been awarded two national awards and it has all been as easy as falling off a log.

Success Expansion

The following school year, the IPM program was expanded to all District schools and support facilities. The District's IPM coordinator projects that it will take the District at least five years to implement all of the IPM recommendations because of budget and manpower constraints. The Kyrene School District has 18,500 students that are now being educated in a safer environment.

The program's success has resulted in numerous mini-research projects and related training opportunities. Subsequent programs have been initiated in other areas. A pilot program in the eastern half of the Navajo Nation is just concluding. This was conducted in cooperation with the Bureau of Indian Affairs (BIA), which has now decided to adopt IPM in all of their schools on the Navajo reservations. Programs are currently being initiated on the Hopi and Gila Indian Reservations. An excellent team is now in place, which incorporates the University of Arizona, Arizona Structural Pest Control Commission (SPCC), and BIA tribal Department of Environmental Quality and industry representatives.

Cost Benefits

After considering *all* the costs involved with the traditional program (contract fees, call back fees, staff time involved in posting notices, etc.), the IPM program costs are comparable.

Key to Success

Impacts have been numerous largely because the University of Arizona now has an interdisciplinary IPM working group which is better connected with SPCC, other state offices, EPA, BIA, Intertribal Council of Arizona, and local media groups.

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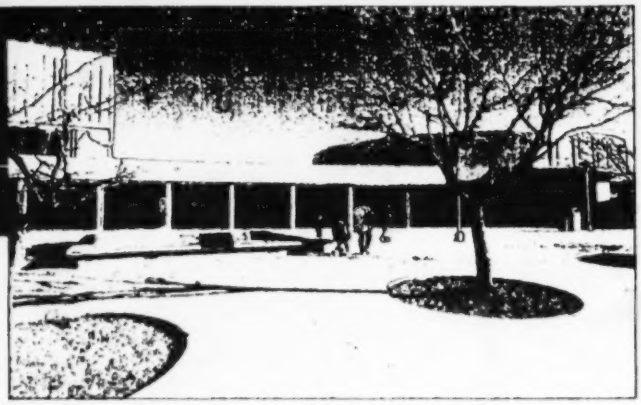
California

Los Angeles Unified School District

By Yana Kucher, *Environment California*



Catalyst for Change

One of the most successful school IPM programs in California started when L.A. Unified School District (LAUSD) parent Robina Suwol dropped off her sons at Sherman Oaks Elementary School on March 30, 1998 and noticed a man wearing a hazardous materials suit spraying a powerful stream of chemicals. As the boys got out of the car, mist from the spray wet their heads and faces, and one son suffered a severe asthma attack. Ms. Suwol called the District (the second largest in the nation, comprising 700,000 students and almost 700 schools) to find out what was being sprayed at the school, and after some research, identified the toxic herbicide.

"The effort started with a couple of parents, but quickly grew to include physicians, teachers, environmentalists, health and policy experts, and organizations such as CALPIRG, Physicians for Social Responsibility, Californians for Pesticide Reform, Pesticide Watch, Action Now, American Lung Association, and Coalition for Clean Air," Ms. Suwol says. She found support from two concerned school board members, and started an organization, California Safe Schools, to reform school pesticide policies and protect children's health.

Safer Policy Adopted

A year after she got involved, Ms. Suwol's coalition succeeded in pressuri[illegible] LAUSD to pass one of the nation's most stringent plan[illegible] phasing out the use of dangerous pesticides, incorporating the "precautionary principle" and parent right-to-know.

Implementation Strategies

With the new policy LAUSD began changing its maintenance and pest management practices across the board. The first step in implementing LAUSD's IPM program was to institute a deep cleaning program of the cafeteria kitchens every six months, with monthly inspections. The previous two-year interval for cleanings led to numerous pest problems, such as cockroaches, rats, mice, and flies. To avoid attracting pests, garbage removal and steam cleaning of garbage bins is now done more frequently.

Creating barriers to keep pests out, such as installing door sweeps on all doors so that pests could not enter, was the next step. Bees have been controlled with traps, such as the Oak Stump Farm Trap, and ants have been controlled using a sponge and soapy water solution and by caulking holes in structures.

For weed problems, LAUSD uses mechanical removal, using string trimmers. The use of bioorganic weed killers, such as clove oil, to replace synthetic herbicides is also being explored.

The District immediately cut down on pesticide use by stopping broadcast spraying and the use of pesticide bombs. With the new policy in place, pesticides are used only as a last resort.

The ultimate goal of the policy is to cut pesticide use to zero. Although that goal has not yet been reached, the District has made tremendous progress. In three years, it has gone from using 136 pesticides to 36, and the remaining ones are being used in the smallest effective quantities.

Keys to Success

A key element contributing to LAUSD's success is an active, dedicated Pest Management Team, which meets every four weeks, consisting of District members, medical experts, community members, parents, maintenance workers, and an independent IPM consultant. Angelo Bellomo, LAUSD's director of the Office of Environmental Health and Safety, also gives credit to pressure from outside the District.

The success of LAUSD's School IPM policy can also be attributed to the extensive training that has driven the program, led by William Currie.

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Colorado

Boulder Valley School District

By Tim Gilpin, Ph.D., *Native Solutions Inc.*

Catalyst for Change

Two years ago, Native Solutions Inc. (NSI) approached the Boulder Valley School District (BVSD) about adopting an IPM policy, with an emphasis on pest control without toxic synthetic pesticides. University of Colorado IPM operators had approached BVSD previously, paving the way for the District's willingness to give NSI a try. As a result, BVSD's director of operations decided to go with "non-toxic" IPM for their indoor pest management program.

Management involves over 64 schools and assorted administrative buildings. Over the years a number of pests have been managed, such as ants, wasps, bees, spiders, silverfish, flies, mice, skunks, pigeons, and raccoons among others. From day one of the program, in each situation the pest problem has been handled effectively and economically without any toxic synthetic pesticides.

Implementation Strategies

The only products used in the last two years of the program have been common borax, hand soap, household vinegar, and orange peel extract house cleaner.

During the first year of the program an elementary school principal reported a wasp problem and asked NSI to spray. After inspecting the school thoroughly it became obvious that holes in the building eves were supplying nesting sites for paper wasps. NSI repaired the holes before nesting occurred and before the wasps had a chance to become established for the season. The wasp population has not reappeared and the principal was astonished, explaining that for the first time in fifteen years the problem had been solved without a reoccurrence.

Rodent control is one of the larger problems at BVSD schools. Before the NSI IPM program was instituted, past pest control operators handled the problem with poison baits, and the problem returned every year. The solution was to eliminate the mice entrances into the buildings, seal up the food sources and remove the established mice population.

First, as mice were being removed from the building, a personal relationship was established with the custodians and teachers in an effort to eliminate the food sources for the mice. This involved storing food in airtight containers or removing it. For example, mice are attracted to food stored in desks and closets, beans used for counting, and noodles on artwork. Once this was done the holes in the buildings where mice could enter where repaired. However this will still not solve the problem permanently for a few mice will inevitably enter when doors are opened. The long-term solution is to immediately remove the few that do enter the building from time to time. This involves staff keeping a vigilant eye out for signs of mice and alerting the custodians so they can remove them before a breeding population becomes established.

Cost Benefits

BVSD saves money by eliminating constant return sprayings for the minimal cost of building maintenance. By getting to the source of the problem, tough pest control issues are solved in a cost effective long-term manner. Shortsighted quick relief with toxic chemicals is expensive in the long run as well as hazardous to health. Now that the head of BVSD operations has seen the success and potential cost savings he is pushing this methodology forward by educating his staff.

Keys to Success

A key to solving many pest problems is participation by school staff and custodians in the IPM program. It is also important that the program coordinator has a strong background in biology as well as a willingness to replace toxic synthetic chemicals with common sense.

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Illinois

Chicago Public Schools

By Julie Dick, *Safer Pest Control Project*

Catalyst for Change

When Illinois passed the *IPM in Schools* law, a law requiring schools practice IPM, in 1999, the Chicago Public School District (CPS), the third largest district in the country with half a million students, claimed that it would be too expensive to implement. The state law allows exemptions for districts, if practicing IPM is not economically feasible. An exemption was granted to CPS, which handled pest management on a school-by-school basis.

Although CPS, with 600 schools, received the exemption, seven schools in the District successfully implemented IPM pilot programs with the help of Safer Pest Control Project (SPCP) in 1997. The pilot programs were proof that IPM could work, even in schools that were deteriorating and prone to pest problems.

SPCP wrote letters and met with CPS administrators to offer support to help the District adopt an official IPM policy. At the same time, a Blue Ribbon Committee on environmental health was formed with District administrators, medical experts, and other interested parties. Within the committee, IPM emerged as a feasible means to improve indoor air quality (IAQ) and environmental health conditions for students. By November 2001, the school board adopted an IPM policy for the CPS District. According to Lynn Crivello, environmental services manager at CPS, IPM is "part of an ongoing program to make schools healthier."

Safer Policy Adopted

The IPM policy commits the District to: provide training on IPM, amend contracts to reflect IPM practices, limit scheduled pesticide applications, and provide notification to parents and staff regarding pesticide applications in writing two business days prior to applications — excluding anti-microbial agents and insecticide and rodenticide baits.

Implementation Strategies

With the help of SPCP, CPS has begun the process of training the school staff on IPM, particularly the building engineers and local school council members. To date, close to 200 building engineers have been trained to use IPM. The entire District did not switch to IPM in one fell swoop, but more and more schools have gotten on board as the trainings have continued.

The CPS building engineers handbook now contains a section on IAQ/IPM best practices, which is distributed to every building engineer employed by the District and outlines job responsibilities.

School by school, IPM is now being implemented in this large district. When R.C. Hardy started working as an engineer at the White School he caught twenty mice in traps over one weekend. He located where they got in and out, put door sweeps on the doors, sealed the cracks and holes in the walls and the rodents have not come back. Hardy keeps the pests away from his school by making sure that food is not left out for rodents or other pests.

IPM Effectiveness

Building engineers say the IPM program works well. One engineer says once he took the class on IPM, he found regular monitoring for pests and a few simple changes in maintenance and sanitation controlled pest problems. The Blue Ribbon Committee and SPCP have been able to further the implementation of IPM in the CPS system. Schools in the District are using fewer pesticides and more effectively controlling pest problems as a direct result of the new partnerships.

Cost Benefits

"If schools use the IPM program they will cut down on using pesticides and cut down on expenses," claims Mr. Hardy.

Key to Success

"The cornerstones of success are the partnership and educational aspects of the program," says Ms. Crivello.

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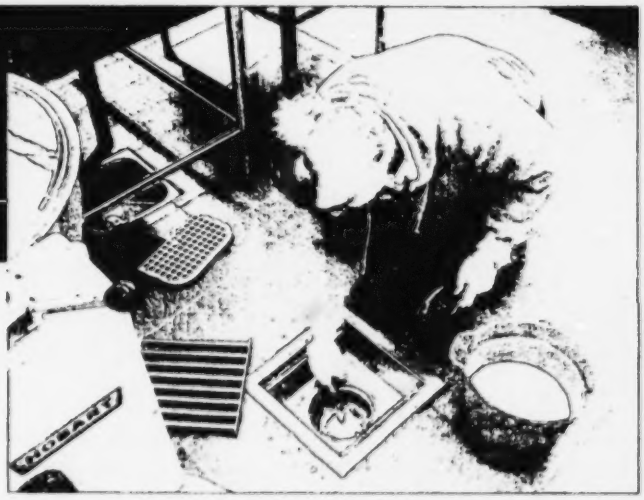
Indiana

Broad Ripple High School, Indianapolis Public School System

By Tom Neltner, *Improving Kids' Environment*



Catalyst for Change

In March 2001 at the Broad Ripple High School, grass and weeds were just beginning to show up. A janitor grabbed a jug of *insecticide* from the shelf, mixed it with diesel fuel instead of water, put it in a sprayer, and attempted to kill the weeds by the storm water drain, by the school air intake and by the open cafeteria window. Shortly thereafter, the school was evacuated and six people spent the afternoon in the hospital.

Fortunately, the janitor used diesel fuel instead of water. While water was supposed to be used, according to the label, the strong fuel smell alerted people that something was wrong. Otherwise, they may not have reacted so quickly to the chlorpyrifos in the air.

Safer Policy Adopted

Seven months later, on October 16, 2001, the Indianapolis Public School (IPS) was the first school district in Indiana to adopt a model school policy that had been developed by the Indiana Pesticide Review Board with the support of Purdue University's Cooperative Extension Service, the Indiana State Chemist, and Improving Kids' Environment (IKE). The pesticide school incident, the threat of state legislation, and the support of the Indiana School Board Association made it happen.

All parents have a right to be notified before pesticides are used under the policy. However, the only pesticides that have been used since the policy's adoption are insecticide baits placed out of the reach of the student, which are exempted from the notification requirements. Pesticides are only applied under the supervision of a licensed individual. All applicators must be trained and pesticides may not be used when students are around.

The grass of the football field is not weed free, but IPS is a struggling urban public school district that is focused on success in the classroom not putting on the cosmetics of a Friday gridiron battle.

Unlike some states, Indiana's policy does not mandate IPM or extensive planning. Instead, the goal is to create the dynamic that fosters IPM success. Accountability and training are the keys. When schools know that parents and staff are watching and people understand the framework for pesticide use, IPM is a natural result. Seventy-seven percent of the public school districts in Indiana have voluntarily adopted the model policy.

Success Expansion

Now the challenge is to make the system work for IPS and the hundreds of other school districts that have adopted the policy but may not have translated it into tangible action. Therefore, IKE is starting the slow process of working with concerned parents and teachers and checking the performance of each school district.

IKE's organizing approach is to start with the public records law. The pesticide applicator invoices for one school district showed that pesticides were applied whether pests were found or not. After IKE showed an initial interest in the school's pesticide practices, glue boards instead of pesticides began to be used. Now the school district is complaining that the pesticide applicator was claiming to practice IPM but it was just a sham.

To target other schools, IKE has requested the reports for school indoor air quality complaints investigated by the Indiana Department of Labor and Indiana State Department of Health, which will help IKE set priorities.

Key to Success

Only through follow-up and accountability will the school system deal effectively with school pest management.

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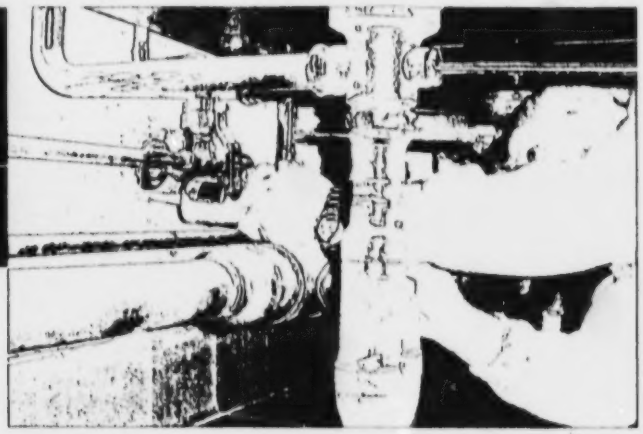
Indiana

Monroe County Community School Corporation

By Marc L. Lame, Ph.D., *Indiana University* and Jerry Jochim, *Monroe County Community School Corporation*



Catalyst for Change

In 1994, the director of planning for the Monroe County Community School Corporation (MCCSC) did occasionally hear about students and teachers that became sick within days of when their school was treated for pests. Associating these absences with pesticides, he was unsure as to what he could do about it.

MCCSC staff jumped at the idea of initiating an IPM pilot program when it was presented by an Indiana University professor, Marc Lame, Ph.D. A maintenance and custodial staff person with 11 years experience, Jerry Jochim, agreed to be trained in IPM and, after the successful pilot, became the IPM coordinator for the 20 schools in the District in 1997. Mr. Jochim learned insect identification and became a licensed PCO, but his skills with energy management, sanitation, and the school community set him apart.

Implementation Strategies

The MCCSC IPM Model is a 22-step process reliant on intensive communication and partnership and based on sound pest management. This model has been successful in the school environment because the cultural and mechanical IPM strategies can be incorporated into the existing custodial and maintenance activities, such as sanitation, energy conservation, building security, and infrastructure maintenance. This model is dependent on an educational approach, which creates an awareness of all school occupants that monitoring, sanitation, and exclusion strategies represent a proactive management strategy versus the more reactive strategy of chemical pesticide treatments.

"Inspect, detect, correct," is a phrase that Mr. Jochim uses to get the custodians to understand IPM. Inspect and constantly look for potential pest problem areas. A spatula is a really good inspection and cleaning tool. If a spatula fits in a crack in concrete, baseboards, wallboards or underneath chalkboards, insects can use that space to access the room. When a hole or crack is found, a concrete patch or silicon gel is effective in sealing the voids.

Custodians check monitor traps on a weekly basis. They fit into corners and on shelves in kitchens and teachers' lounges and problem classrooms. Baits are only applied if there is a problem. Trapping methods for rodent control are used. Rodent baits are not because they can relocate the bait poison and the pellets can get into cafeteria food.

Specific problems areas in MCCSC schools include plants, garbage, custodial, and teacher's closets, bathrooms, ceiling tiles, doors, school pets, recycling areas, kitchens, and clothing donation boxes.

IPM Effectiveness

The average pesticide reduction has been 90 percent with a similar reduction in pest problems. Before the IPM program was implemented, the cost of pest management was $34,000 annually. After Mr. Jochim started working on the program, that cost was cut to about half. The total cost is significantly less because there are very few pesticides used.

Keys to Success

It is important to remember that there is going to be a transition period when starting an IPM program. But after the school staff make some initial changes, it becomes normal, routine. IPM may even be less work. Keeping the clutter to a minimum and inspecting for maintenance repairs is key.

Success Expansion

MCCSC is a model IPM program that has impacted over one million children nationwide. School districts in Alabama, Arizona, California, Indiana, and the Navajo Indian Reservation use this model.

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Maryland

Friadelphia Ridge Elementary School, Howard County Public Schools

By Paul Ruther, *Center for Health, Environment and Justice*

Catalyst for Change

The decision to undertake IPM practices at the new Friadelphia Ridge Elementary School (TRES) in 1998 was inspired, in part, by the Howard County PTA's Health Environmental Issues Committee (HEIC). HEIC advocated not only for right-to-know legislation regarding pesticide use but actively researched IPM policies, procedures, and practices in order to reduce toxic pesticide use at schools. By working cooperatively with the school system's Custodial Services, Ground Services, and Safety and Regulatory Departments, HEIC helped create, implement, and support an IPM program, largely assisted by parent volunteers.

Implementation Strategies

At TRES, parent volunteers participate in general maintenance, such as cutting back flowers, mulching, weeding, and edging so that pesticide applications are unnecessary. Lisa Schultz, who had her son transferred to TRES because his other school's historical routine use of Dursban™ and other pesticides made him ill, co-coordinates the Garden Committee. She and six to eight parents and their kids attend three weeding sessions a season, spreading mulch provided by the District. HEIC along with TRES's own Issues Committee also monitor the MSDS sheets and product labels for pesticides that are proposed for use. HEIC also monitors the installation and baiting of wasp and yellow jacket traps.

To treat pests on the grounds and inside the school, standard IPM techniques such as caulking holes and cracks and vacuuming up small insects, e.g. ants, are employed. Glue traps are also used for insects and sharp traps for rodents. They have also used red-spider mites and use an herbicidal soap and prune to control bagworms. This work is labor intensive. Hot soapy water is sprayed on yellow jacket and wasp nests. Along with spraying non-pesticide solutions, jar traps are used far more extensively at TRES than at any school in the county. When the school developed a yellow jacket infestation, nesting areas were eliminated and non-toxic stinging insect traps were used. Gallons of wasps were removed from the school.

The assistant manager for the school system's Grounds Services Department, says his department practices IPM because "it's a good maintenance practice and is just common sense . . . most of what we do is cultural controls."

IPM Effectiveness

The county has not used herbicides for weed treatment, even on athletic fields, according to school officials. The PTA volunteers make the job easier and are a dedicated group who have helped make TRES the county's most advanced IPM program.

Expanding Success

Thanks in part to the successful implementation of the IPM program, TRES recently received the prestigious Governor's Green School award for environmental leadership.

The nearby Lime Kiln Middle School (LKMS), opened in 1999, has adopted a similar program and children diagnosed with chemical sensitivities have been able to attend both schools regularly without frequent medication. TRES and LKMS were selected by the county as two of six designated subjects being examined as part of a two-year U.S. Department of Agriculture study that will measure the effectiveness of "Least Toxic" IPM approaches.

HEIC has pushed for the creation of an IPM committee and the hiring of an IPM coordinator to address the county's policies. HEIC has also asked the school superintendent to consider making the voluntary low-risk maintenance program permanent.

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Maryland

Montgomery County Public Schools

By Paul Ruther, *Center for Health, Environment and Justice*

Catalyst for Change

Montgomery County, Maryland has one of the nation's longest running school IPM programs. Pest control technicians have used innovative approaches to pest management since 1985 and by the mid 1990s, the program had switched from a reliance on Dursban, diazinon, and pyrethrum to an IPM system using least toxic approaches. Today, a 6-year school system employee, Richard Stack, who used pesticides routinely in previous jobs but now believes they are 99% unnecessary, was hired as the county's first IPM Supervisor in 1999, the same year that Maryland passed its outdoor IPM law, which followed the 1998 indoor IPM law. He now supervises a staff of four.

Implementation Strategies

The IPM crew removes most wasp and hornet nests manually, rodents via traps and uses vacuum cleaners readily to eliminate small insect pests. Pesticide applications are only used for spraying yellow jackets in areas where there are inaccessible wall voids. Even beehives are removed by hand.

School building and cafeteria staff, who have annual training, are central to the program's success. Teachers, administrators, and students are also recipients of IPM education and each school has a public IPM logbook, containing sanitation recommendations and complaint sheets. This book is filled out during the inspection and monitoring of each school and is done twice a month or whenever necessary. The intensive inspection includes the food service areas, trash room, loading dock, and meeting with the building services manager to determine if there are any problems. Inspectors examine sanitation, structural deficiencies, and recommend cultural techniques with the understanding that early detection is the key to prevention.

The school IPM program involves training the school staff that implements the program twice annually. Monitoring sites are divided into monitoring zones, the primary one being food-related areas. In response to an infestation, glue boards, baits, caulk, vacuuming, soapy water, insect growth regulators or traps are used. The success of the program was largely due to the preventive measures used: sanitation, heat treatment, sand blasting, biological management, and pest exclusion. Storage practices were altered, design of storage shelves changed, and inspections of incoming and outgoing food instituted.

Pesticide Use Reduction

Mr. Stack reports that pesticide use has been reduced every year since becoming supervisor. If his department must use pesticides as a last resort, he does so when no children are present and provides a 24-hour notification period as required by state law. He says that he would inform any parent of a chemically sensitive student if he were to spray a pesticide. But, he has not had to apply insecticides in a school with such a student other than emergency applications for stinging insects in the absence of students and staff.

The county avoids herbicides at all costs and only uses them if weeds, such as poison ivy, cannot be completely eradicated manually. While Stack admits to having received 300 requests from schools that want herbicides applied over the past five years, he still uses them sparingly, having only sprayed five times in the past two years.

Cost Benefits

Stack believes the overall expenses of an IPM program, including increased labor, are less than that of a pesticide-based program. Reducing reliance on expensive chemicals dramatically offsets IPM program costs.

Expanding Success

Montgomery County has been a point of contact for many school districts from states including Kentucky, New York, Texas, and Washington State.

Contact: Center for Health, Environment and Justice and Maryland Pesticide Network (see previous case).

Massachusetts

Sherborn School System

By Sherry Ayers, *Toxics Action Center*

Catalyst for Change

While an IPM plan was officially developed for Sherborn's elementary school at the end of 2001 in response to requirements under Massachusetts' new *Children and Families Protection Act*, school IPM has actually been on-going for some time. This is due to the efforts of Ralph Kelley, supervisor of plants and facilities for the three elementary schools, the regional middle school and the regional high school in the towns of Sherborn and Dover, located 30 miles southwest of Boston.

Implementation Strategies

Mr. Kelley prefers to tackle pest problems through prevention and manual/mechanical solutions. "You have to physically check the buildings. Exclusion is a big percentage of the problem," says Mr. Kelley. Not only does he check the buildings but his staff have also been trained to walk around and observe structural features: is weather stripping and caulking in place, are covers on garbage cans, are the dumpster covers shut, are storage areas secured. Facilities staff have checklists of inspections to be performed daily, weekly, and monthly. Kitchens are priority areas for regular inspections when it comes to pests.

As any facility maintenance personnel know, unexpected tasks are the norm, so trying to get things done on a regular basis can be difficult. That is one reason why preventing pest problems can be so important — it reduces the amount of effort one needs to put into pest management in the long run.

One particular effort "has made a big difference for relatively short money," according to Mr. Kelley. Because bees and wasps are among the primary pest problems in the schools, especially considering some students' allergies to stings, Mr. Kelley and his staff installed screens on all air intake and outlet ports around the school. This resulted in a dramatic reduction in time spent removing these unwanted visitors.

When pests do manage to sneak into the buildings, the first line of defense is to contact the maintenance staff who will usher the pests back out by opening a window or catching them. Mr. Kelley has rigged up a scraper on a long pole for removing bee and wasp nests from outside areas close to the building. Other pests may be caught in one of the monitoring traps placed around the school by the pest control contractor. Issues surrounding identified pests are evaluated on a case-by-case basis.

It is routine practice to include a notice in the teachers' newsletter in September reminding them that they are not to bring any types of pesticides (or other chemicals) into the school. Instead, maintenance staff are to be alerted to any known or suspected problems for their resolution.

Success Expansion

Mr. Kelley is working with the Sherborn Groundwater Protection Committee, which has an interest in pesticide use reduction to protect the drinking water wells in town, to plan future IPM efforts. And expanded educational outreach about the school's IPM program is planned for the school's medical staff, administrators, and parents.

Mr. Kelley's philosophy extends to areas other than pest management. For example, he uses a special cleanser dispensing system with a limited number of non-toxic cleaners that are provided in concentrated form and then mixed with water via a system that dispenses pre-set amounts of cleanser, thereby avoiding unnecessary waste.

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Massachusetts

Wellesley Public Schools

By Sarah Little, Ph.D., *Town of Wellesley Health Department*

Catalyst for Change

The town of Wellesley has generally been ahead of the curve when it comes to pesticide awareness. The town first commissioned a pesticide use study committee in 1994. This committee conducted a survey and recommended that the town initiate a pesticide use reduction effort. However, this effort had been minimal until the town, at the urging of a citizen's group, the Wellesley Cancer Prevention Project, hired a part-time pesticide awareness coordinator, Sarah Little, Ph.D. A year later, after a grant funded the creation of the Wellesley Pesticide Awareness Campaign, the state of Massachusetts enacted legislation governing pesticide use on school grounds and requiring all schools to have indoor and outdoor IPM plans.

Implementation Strategies

The development and implementation of the IPM plans required meeting with building and grounds supervisors, meeting with the pest control company contracted to respond to pest problems, and meeting with representatives of the Health Department, Schools, Department of Pubic Works (DPW), and Natural Resources Commission to discuss pesticide application procedures and alternative pest management practices.

Eliminating all pesticides not used to control a health or structural pest and employing pest prevention strategies are key components of the plans. The indoor IPM plan follows state law and only allows applications of baits, gels or dusts in areas inaccessible to children. In a kindergarten classroom, insects were vacuumed, instead of sprayed with pesticides.

The outdoor IPM plan eliminates all pesticide use except in health emergencies, or in property damage emergencies, and only when no viable alternatives to chemical pesticides exist. The schools generally use few pesticides outdoors. The ones it does use are products containing the active ingredient glyphosate for poison ivy and weeds in sidewalks, knock-down sprays for stinging insects, ant baits and dusts, mice baits, and occasional grub control.

In the case of poison ivy, the DPW refused to pursue alternatives to glyphosate, so a parent's volunteer group was formed to hand pull the ivy on school grounds. In the case of yellow jackets, the plan calls for mint oil based knock down sprays.

Key to Success

Wellesley schools are more fortunate than most due to the presence of the town's pesticide awareness coordinator who watchdogs the IPM implementation. Dr. Little attends meeting with health, town, and school officials and has an ear to the ground regarding pest control activities. Her presence has thwarted plans to mistakenly use pesticides recently banned under Massachusetts's school pesticide law. A true monitoring plan, however, needs to extend beyond one person.

Cost Benefits

Having a volunteer group of parents pull weeds saves the schools about $400 per call, because it eliminates the expense of the state required parental notification for pesticide applications and the cost of the chemical.

Expanding Success

The town of Wellesley has recently adopted IPM for all of its properties. By shifting overall management practices in the town towards pesticide reduction, Dr. Little hopes to change attitudes concerning pesticide use on school grounds as just "a matter of course" of how land can be cared for in Wellesley.

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Michigan

Lewis Cass Technical High, Detroit Public Schools

By Kate Webber and Betsy Dance, *LocalMotion*

Catalyst for Change

In 1997, a Detroit area high school was having serious problems with roaches, mice, and rats. At the same time, Larry Swain, pesticide certification/IPM manager with the Michigan Department of Agriculture (MDA), was seeking a pilot school to participate in his IPM program. When they got together, the result was a pioneering student-run IPM program to rid Detroit's Lewis Cass Technical High School's eight story brick and granite building of unwanted pests.

The program originated with students in Michael Jones' science class assisting a homeowner with a termite infestation. While researching for the project the students learned of the grant for a student-run IPM program from MDA.

Implementation Strategies

Mr. Swain trained the students in pest identification and showed them how to perform inspections of the building. Praxis, the developer of the Bio Tool Kit™, a complete biological pest control program, also trained the students. Mr. Swain also brought in experts from the Michigan Pest Control Association and the University of Michigan.

Five years later the IPM Team, overseen by Mr. Jones and run by students, is managing the pest control at Cass Tech. For each pest problem, the Team, comprised of approximately 20 students, deploys an appropriate pest management strategy.

To control German cockroaches, the Team focuses on biological controls and habitat modification. The "Roach Patrol" seeks out leaky pipes and reports them to custodial staff. The biological controls employed include sticky traps baited with roach attractants, bait stations containing nematodes or parasitic wasps, and hormones that disrupt the cockroach's ability to sexually mature and reproduce.

To rid the building of rats, a feast of peanut butter and vitamin D pills is used. The vitamin D, harmless to humans in such quantities, is able to cause a lethal heart attack in the rodent.

Meticulous forms detail pest sighting. Detailed maps show exactly where — kitchen, pool, locker room, janitorial closets — the Team has deployed which management technique. There is a final form that tallies the number of captured pests to show the success of a given strategy.

Mr. Swain attributes a dramatic reduction in cockroaches to the successful pest identification and control by the Roach Patrol. He has challenged the students to set new goals for the program, one of them being to stop the "roach highway." "Pests are a community problem," states Mr. Swain.

Mr. Jones measures the program's success in the changed attitudes of the teachers. "Teachers use to not even consider calling the Team. Now if there is a problem they call on the Roach Patrol."

Key to Success

The students find ways to convince their fellow students that their participation is necessary to the success of the program. Student Shanika Coach, who works on the Team's outreach said, "We use art work, educational pamphlets, and PowerPoint presentations to make students and teachers aware of the program. That's how we impose a challenge to other students so they will not feel free to throw candy wrappers on the floor. A roach can live in a candy wrapper for three weeks. Candy wrappers invite trouble."

Mr. Jones explains that Cass Tech's program is not strictly about rats and roaches. "The students learn a higher order of thinking. They see the problems, put the plan together, analyze it and decide what to do based on scientific knowledge. It's a process they can use in the real world."

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Michigan

West Ottawa Public Schools

By Melissa Vachon, *LocalMotion*

Photo by Jason Mahnsky

Catalyst for Change

Gary Brezinski had been director of building services at West Ottawa Public Schools for five years when he began reading articles about how pesticides can affect learning in children. Mr. Brezinski, who manages 13 buildings that house 8,000 students and staff, felt that children have enough challenges without the added harmful effects of chemicals. So he began to look into "alternatives," generated support from the District, and had an IPM policy adopted. Michigan law already required that parents be notified each year by letter that they can request to be informed if pesticides are used in or around the schools. Mr. Brezinski receives a large response each year from parents asking to be put on the registry.

Implementation Strategies

Mr. Brezinski worked with a Michigan-based IPM company, Get Set, which provided the model IPM policy that was adopted, and launched an advertising campaign through area newspapers and the local cable channel to educate the community on pesticide hazards and IPM. Get Set's founder, Steve Tvedten, quickly identified the food source of the pests. Ten years later, boric acid is the most poisonous substance that has been used inside a West Ottawa school building since the switch to IPM. Mr. Brezinski and his staff inventory the buildings and eliminate opportunities for pests. To prevent problems, they employ door sweeps, find and block openings, caulk holes, and just "make things fit tighter." Enzymatic cleaners containing peppermint oil deter pests from commonly infested areas. Citronella beads in dumpsters keep stinging insects away. Mr. Brezinski's favorite tools are vacuums. A little baby powder in the vacuum bag kills pests once they are sucked in.

State law requires that anyone applying a pesticide in a school must be a licensed pest control operator trained in IPM. School staff are informed not to bring pesticide spray cans into the building and given information on IPM and practices that attract pests, such as cardboard stored in closets, food not properly contained, and crumbs and spills not properly cleaned.

Cost Benefits

The District paid $8,000 to $12,000 per year for regular visits from a pesticide applicator. Special situations, such as relentless infestations of termites, ants, or mice could cost an extra $8,000 to $10,000 per year. Get Set charged the District an initial $1,200 per building, or $15,600 per year. Mr. Tvedten mad regular site visits, attended to all pest problems, trained staff, and provided an IPM manual. Now Mr. Brezinski and his staff are familiar with IPM and implement the program themselves. The District now pays a $2,000 consultant fee to Get Set each year. It spends $2,000 to $3,000 on products and less than $1,000 on equipment annually. After a few years of transition to IPM, the District is now saving an estimated $10,000 a year on pest control.

Keys to Success

Mr. Brezinski suggests having someone in charge whose decisions will be respected. In regards to toxic pesticides s/he needs to be able to say, "No, we are not going to do this." The person in charge also needs to be "persistent and willing to take some heat."

Mr. Brezinski attributes his success to communication between all concerned parties (parents, students, staff, school board), the fact that IPM works and his own stubborn personality.

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New Jersey

Evesham Township School District

By Joseph. B. Tobens, *Evesham Township School District*

Catalyst for Change

In 1994, in response to a request by a township parent and the New Jersey Environmental Federation, Evesham Township School District was the first school district in Burlington County to adopt a written IPM policy. The District (the fourth largest K-8 district in the state, with 1,000 staff and 5,400 students, 750,000 square feet of building space, and 200 acres of outside space) had practiced IPM for six years prior to adopting the policy because of its concern for the students, staff, and public using the facilities. In 1988, the District totally eliminated the storage of any pest control chemicals in its schools. The facilities manager, Joseph Tobens, always had the philosophy that chemicals should be kept out of the schools.

Implementation Strategies

Evesham's IPM program relies primarily on a combination of the following:

- Pest monitoring and inspection.
- Good sanitation along with proper building and grounds maintenance (cleaning, sealing cracks and holes, repair screens, etc.).
- Baits (gels and granular) and traps (pheromone) if needed.
- Only when necessary, use of residual pesticides with the lowest level of toxicity that will do the job. Spot treatments are used rather than blanket cover sprays.
- Communicating concerns for student and staff safety with these certified applicators and vendors.
- The pest control professional has the knowledge to control pests. District staff knows the problem areas to show the professional. *Between* the two, a plan can be developed and implemented to control pests.

Some years ago, the H.L. Beeler Elementary School had a fungus gnat problem. At the time, the insect was unknown to the District and many exterminators. There were insects flying around in the classrooms. The District contacted a certified entomologist who identified the insect, its breeding ground, and how to control it without the use of chemicals.

For its athletic fields, the District over-seeds every year and fertilizes to promote growth to keep out the weeds. Chemical weed control is performed on a few occasions only when children are not on the premises and preferably on a weekend or school vacation.

Pesticide Use Reduction

The District relies on monitoring, proper cleaning, good maintenance, and the use of traps and baits for pest control. Since the District adopted IPM eight years ago, only two chemical treatments have been made. Organophosphate, carbamate, and solvent-based pesticides have been eliminated from use in the buildings.

Outside, the cushion materials under playground equipment are maintained without pesticides. Although it does take more time to hand pull weeds, the District recognizes that children roll, crawl, dig, and walk in the mulch around the playground equipment.

Cost Benefits

IPM, which does not cost that much more than conventional pest control, reduces the need for chemicals and increases the labor for inspection and investigations. During the 2001-02 school year, the District spent $5,702 ($0.008 per sq/ft) for professional pest management. The cost for involvement of school district personnel is not known due to the varied nature of their jobs.

Keys to Success

Difficult problems can be solved reaching out beyond usual contacts. The biggest secret to IPM is very simple. It is maintaining clean buildings and keeping all the cracks and holes plugged. IPM is an important part of a safe and healthy school environment.

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New York

Albany City School District

By Pam Hadad Hurst, *New York Coalition for Alternatives to Pesticides* and Claire Barnett, *Healthy Schools Network*

Catalyst for Change

The Albany City School District located in Albany County, New York (with 10,000 students, covering 16 plus buildings, 2.1 million square feet, 96 acres) did not always have an IPM program. A teacher concerned about pesticides first alerted other staff, then, according to the current supervisor of buildings and grounds who has been on staff for over six years, attended an IPM conference afterward searched for a contractor that could implement IPM in the District. At that time the current contractor was hired.

Implementation Strategies

The District claims not to use pesticides. An outside contractor runs its IPM program with two people who cover IPM in the buildings only. Baited traps, hidden from children and checked weekly by school maintenance and kitchen staff, are used to lure cockroaches, mice, and sometimes rats. Thorough, routine cleaning and regular building structural maintenance, such as repairing cracks, leaks, and plugging holes are critical components of the IPM program. In addition, non-toxic methods are used for pest control, such as a soap and water solution at the base of a tree to keep bees away from the area where children and others are likely to pass.

Most of the school buildings in the District have adopted a "team cleaning" approach, with coordination between the facility director, custodial staff, and the contractor. Record keeping on pest sightings and pest management is ongoing.

Teachers have been a driving force in promoting IPM because they do not want spraying in classrooms. However, because there are buildings without cafeterias students must eat in their classrooms. It has been difficult to make sure that all classrooms are kept clean and free of food and debris.

Key elements identified by the contractor include: the use of traps, exclusion of pests from premises, and staff training on pest prevention.

Some barriers to the success of the program include:

- Teacher resistance to keeping cleanup of food in classrooms under control; and,
- Costs of door sweeps, screens, and structural repairs are not within the District's budget.

Cost Benefits

The District feels confident that it is protecting children and other building occupants from pesticide exposure. In the short term, the contractor believes that the IPM program may cost more because it requires more labor, but in the long term, it is cost effective. Money has been saved on the purchase of expensive pesticides.

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New York

Baldwin Union Free School District

By Pam Hadad Hurst, *New York Coalition for Alternatives to Pesticides* and Claire Barnett, *Healthy Schools Network*

Catalyst for Change

The Baldwin Union Free School District located in Nassau County, New York has award winning IPM and indoor air quality programs. In 1987, Baldwin (comprised of five square miles, 900,000 square feet of building space, 5,311 students and 700 faculty and staff) was cited by EPA for noncompliance with the federal Worker and Community Right to Know Act because of improper chemical use and storage, poor staff training, and access to information, all practices common to schools. As a result, Baldwin implemented extensive changes and became a national model.

In 1988, the District hired a new director of facilities and operations to replace a custodial management firm. He, along with the high school science chairperson, spearheaded the District's Health and Safety Committee, including union and community representatives, who prompted the overwhelming passage of a $7 million bond issue to tackle safety and maintenance concerns.

In 1993, the NY State Attorney General released his *Pesticides in Schools* survey, finding widespread highly toxic pesticide use in schools throughout the state. In response Baldwin formed an IPM Committee to devise a strict IPM plan, later adopted by the Baldwin Board of Education, which requires adherence to the AG's IPM recommendations, use of least-toxic pesticides, pre-notification to parents and staff (before it was required by law), warning signs, the use of only NY State Certified Applicators (required by law), maintenance of detailed records, and a prohibition of aesthetic pesticides use. Over an 18-month period, the Committee drafted an IPM booklet for staff, students, parents, and community residents, defining terms, explaining the process, and outlining the full set of responsibilities and procedures for a successful IPM program.

Implementation Strategies

The Baldwin IPM booklet outlines the District IPM strategy, including a clear policy limiting pesticide use to times only when absolutely necessary after rigorous review, designation of roles of various participants in the program, including students, staff, and parents, and a detailed description of procedures. The Booklet emphasizes 'pest prevention' and outlines measures such as sanitation and structural repair, as well as the employment of physical and mechanical controls, such as screens, traps, weeders, and air doors. Specific methods are outlined on entryways, classrooms, and offices, food preparation, and serving areas, rooms and areas with extensive plumbing, maintenance areas, playgrounds, parking lots, athletic fields, loading docks, refuse dumpsters, turf, ornamental trees, and shrubs. Monitoring of pest activity is accomplished with regular checking of sticky traps.

Cost Benefits

Initially there was an increase in spending, however, the District has since saved money through a gradual decline in spending on pesticides. It has shown a 20-25 percent reduction in pesticide-related expenses. Most of the money spent on IPM goes toward labor rather than chemicals.

Keys to Success

It is important to have a specific committee focus on IPM. The people involved and participatory process contributes to the success of the program. Staff orientation and training are also key, coupled with an open process of notification and procedures for dealing with concerns.

Success Expansion

As a result of Baldwin's successful work on IPM, the District also has developed an award winning protocol on indoor air quality, which is outlined in an *Indoor Air Quality (IAQ) Manual For Staff, Students, Parents, and Residents* and referenced on the NYS Education Department website.

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New York

Locust Valley Central School District

By Pam Hadad Hurst, *New York Coalition for Alternatives to Pesticides* and Claire Barnett, *Healthy Schools Network*

Catalyst for Change

The IPM program for the Locust Valley Central School District (LVCSD), located in Nassau County, New York, began around 1994 when a parent approached the Board of Education with a concern about pesticide use. The District covers 375,000 square feet of buildings, 2,214 students, and 600 faculty and staff. Other parents, one of whom was a Board member, expressed concern. The Board passed a resolution establishing an Environmental Committee to "oversee, in conjunction with the director of facilities and the School Board, a program committed to the non-use of any substances deemed to be questionable with regard to the health and safety of any person in or on school grounds, and to promote environmentally sound options." The resolution directs the use of natural organic products and mechanical methods, regular inspections, the use of non-toxic solution to problems, a 'least-toxic' approach when absolutely necessary, careful record keeping, including availability of records to the public, an annual report to the Board and Committee review of written suggestions.

The Committee has focused on IPM, which is often referred to as "an organic program excluding synthetic chemicals." The Committee recommended that least toxic strategies and methods follow guidelines of specific organizations, such as the Northeast Organic Farming Association (NOFA). Wide support is attributed to the high incidence of breast cancer on Long Island and its link to pesticides.

Implementation Strategies

The pest problems facing LVCSD include termites, bees, geese, and poison ivy. Periodically, German cockroaches are a problem. Thorough cleaning, with special emphasis on food service areas, restrooms, and other areas with extensive plumbing, is a priority. Cleaning, with environmentally preferable products, is an important pest prevention strategy. Custodial staff are trained on proper cleaning methods. Pets and snacks are allowed in the classrooms, which creates the need for even more targeted cleaning. The facility director is a certified pesticide applicator and is fully knowledgeable with regard to IPM practices. He also relies on an outside consultant for input and pest monitoring. Sticky traps, especially in kitchen and other food areas, are monitored on a monthly basis. Caulking and sealing of holes or cracks in the foundation is a common practice. Floor tiles are tightly sealed.

The District is working with a certified organic landscaper. Clippings and kitchen scraps are composted and the finished compost is used as a fertilizer and soil conditioner. A Border collie patrols fields for geese and if necessary, chases them away. Termites are controlled using a least-toxic baiting system that is self-contained and does not leach. Bond funds allow for screening windows, an expansion of organic methods, including an extensive irrigation system, aeration, and expanded composting.

Cost Benefits

The District has not conducted an analysis of whether or not cost savings have been achieved. Since pesticides are not purchased, this has been a savings. However, the IPM program is labor intensive.

Keys to Success

Parents stress the importance of written policies and mandates against the use of pesticides. They also indicated that having a specific Committee to focus on the issue is extremely important. Cooperation of school officials is also critical. School officials need to play a leadership role in preventing pesticide use. Parents also indicated that despite tremendous success and cooperation, problems still arise, so vigilance and perseverance is essential.

Contact: Peter Vasilas, environmental committee chair, Locust Valley Central School District, 11 Hilltop Drive, Bayville, NY 11709, 516-628-2296; NYCAP and Healthy Schools Network (See Baldwin case for contact information).

New York

New York City Public Schools

By Thomas Green, Ph.D., *IPM Institute of North America*

Catalyst for Change

The director of pest control for the New York City Department of Education, Dan Dickerson, began implementing IPM in 1985 when he was the pest control supervisor of the schools in Queens. Now the director, he oversees the nation's largest school system, with 1,263 school buildings and a population of 1.2 million students.

Implementation Strategies

At the onset of his program, improvements were made in training, equipment, and materials used. His staff utilize practices that include sanitation to prevent pests from reaching food and water resources. New trash and recycling rooms are refrigerated to keep pests out. "High Efficiency Particulate Air" (HEPA) vacuums with special attachments are used to suck up pests and pest debris when an occasional infestation is found. This technique eliminates the need for pesticides to "knock down" the infestation.

Staff use an enzyme-based cleaner, "Super-C Professional," to remove pheromones left by ants and cockroaches on surfaces to attract other pests. By disrupting "chemical communication" between pests, large infestations are avoided. Repairing pest entry points and harborages is also a key strategy. The staff has used more than 8,000 tubes of silicon caulk since 1998 to seal up cracks and crevices that provide pests entry into school buildings and hiding/nesting places once they arrive. Snap traps for rodents are also used. These are used only inside tamper-resistant bait stations, typically placed in areas inaccessible to children and/or glued to the floor to prevent removal and only opened with a special key.

IPM Effectiveness

The New York City system has reduced overall pesticide use by over 90 percent, with a 95 percent reduction in service calls since the adoption of its IPM program. These accomplishments have been recognized by EPA, which awarded the program a certificate for outstanding efforts towards risk reduction in 2002.

The program has eliminated spray and fogging applications in favor of ready-to-use baits and traps. No pesticide concentrate formulations have been used in the past three years. Organophosphate, carbamate or pyrethroid pesticides are not used.

Mr. Dickerson participates in the school IPM working group of the National Foundation for IPM Education. He has also helped shape a new school IPM certification program offered by the IPM Institute of North America, which uses third-party evaluators who visit the school and "grade" the school on the effectiveness of their IPM program in managing pests with least-hazardous options. Mr. Dickerson's program is part of EPA's Pesticide Environmental Stewardship Program and files reports to EPA's website (http://www.epa.gov/oppbppd1/PESP/).

"Educating regulators is a big issue," Mr. Dickerson reports. "When schools are cited by health departments for code regulations when insects are found in monitoring traps, pest managers are penalized for using IPM. We need to overcome this obstacle if we're to be successful in recruiting everyone to the IPM way of doing things."

"Recruiting everyone to IPM is important for all of us," Mr. Dickerson continues. "Many of our schools sit shoulder to shoulder with restaurants, hotels, and other buildings that can have pest problems. It makes our job 100% harder when next-door neighbors don't have effective IPM programs and become breeding grounds for pests that then head our direction."

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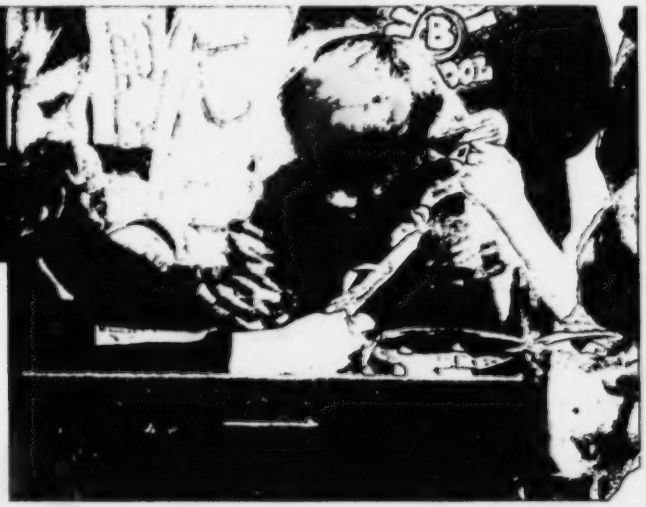
North Carolina

Pitt County Schools

By Susan Spring, *parent-activist* and Fawn Pattison, *Agricultural Resources Center*



Catalyst for Change

A third grader in Pitt County Schools forgot his backpack in his classroom on the last day of school in December, and when his mother, Susan Spring, returned to school to get it, she encountered men swarming the building with pesticide spray and bombing equipment. Spring was quite worried about what would happen to the health of students and staff in the school after the holidays.

Ms. Spring's neighbor's son, going to a middle school, said that his school was so badly polluted that the air was hard to breathe and that stuff was dripping on the walls after "bombing." He got a bad "flu" in January upon returning to school.

Activist parents joined with local League of Women Voters, Sierra Club, and PTA groups to raise awareness about pesticides and kids. They held forums, lunches, teach-ins, got media coverage from local TV and gradually grew to a force of 30 or so families, constantly putting pressure on the administration.

Administrators and maintenance heads were wary at first, harboring a strong belief in the safety and efficacy of the chemicals. Teachers, however, were supportive, and though they could not risk sticking their necks out publicly, they provided vital information to the activists.

Just the image of that stuff covering desks that kids were going to come back to, was enough to keep parents going. Before the bombing was permanently stopped, parents would go into their children's classrooms and cover the desks with newspaper before pesticide treatments so that there would be less residue when children returned.

Implementation Strategies

Pitt County Schools began its IPM program in 1993 with pilot projects at two middle schools, A.G. Cox Middle and South Greenville Schools. The programs went well and in the fall of 1995 the IPM program was expanded to cover seventeen schools, and the Facility Services and Transportation Departments. Now, all school locations in Pitt County are part of the IPM program.

The core of Pitt County's program is to first identify, through inspections and monitoring, the pest problem. Only least-toxic chemicals, such as boric acid, are used, and only after other IPM strategies, such as exclusion, have failed. Spot treatments with pesticides are used as a last resort.

The program seems to be slipping a bit as budget cuts have put principals in charge of pest control in many schools, rather than an IPM coordinator. Without commitment at all levels, the program is harder to maintain. Once there had been several years of attention to toxics, people believed the problem was solved.

A handful of other North Carolina districts have or are working on IPM policies, and a pilot program at NC State University provides technical assistance in IPM for schools. State and university officials, who hope the program will be expanded, stress the significance of parent and community group involvement in establishing and maintaining successful school IPM programs.

Key to Success

Pitt County presents a lesson: parents and others work hard to get good policies in place, and unfortunately still have a big job to do. Part of the formula for a successful school IPM program is community participation. While pulling the weeds and setting the roach baits should not be parents' jobs, checking in regularly with the school administration and serving on advisory boards is definitely part of the assignment.

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Ohio

Princeton City School District

By Carol Kauscher, *D'Bug Lady Pest Management Company*

Catalyst for Change

The Princeton City School District, located in a suburb north of Cincinnati, Ohio, hired D'Bug Lady Pest Management Company in the summer of 2002 to implement an IPM program at two of its eleven school buildings, which comprise over 100,000 square feet with 731 students.

Implementation Strategies

The IPM program began with an educational presentation by the company, addressing the importance of inspections, ongoing monitoring and open communication with everyone in the school. The speaker described the methods and products for various insect and rodent problems, including non-toxic environmental modification to repel pests, and least-toxic chemicals.

The company and the District made the commitment not to spray, fog or bomb anywhere in the building for six months, keeping sprayed poisons from interfering with the attraction of the pests to the food bait.

During the company's pre-treatment inspection of each building and perimeter, the District's custodian supervisor pointed out areas requiring treatment and shared details about specific problems. Teachers returned forms containing information about pests in each classroom, helpful information during the IPM clean-out baiting program that treated areas where water and food were available. Many classrooms have a small wet sink. The kitchen and several bathrooms in the building offer ideal nesting/harborage near water and food.

The following products were used in the IPM clean-out treatment: MRF 2000 roach food bait, Drax ant food bait, and Niban FG roach and ant bait, with boric acid as the active ingredient in all three products; bait box for mice and rats, a chemical in a locked box to prevent humans from reaching the poison; and, Drione for wasps and bees, containing pyrethrins, piperonyl butoxide, and technical amorphous silica gel. Sticky boards were used for monitoring insects and rodents.

Although non-toxic methods are preferable, sometimes it was necessary to use a least-toxic method with a minimal amount of chemical. For example, in another school in the District, a nest of bees was observed at the top of a three-story building next to a classroom. Working at night and using a boom to reach the entry point, the technicians dusted Drione directly into the opening. As the bees entered and left the nest, they picked up the chemical and contaminated the entire colony. Within two weeks all the bees died. Then the entry point was permanently sealed. Applying the chemical directly at the entry point reduced the amount required to kill the bees and prevented the chemical from dispersing into the air next to the classroom.

The first phase of the program was successful. The targeted pests were eliminated in less than three months. After the treatment was completed, the monthly IPM maintenance program began. Teachers and support staff recorded pest sightings on monitoring forms that were reviewed by the pest control company during monthly inspections. This process encouraged vigilance by the staff and eliminated unnecessary treatment. To prevent ongoing pest problems, storage areas were cleared of unused materials, and metal containers were distributed to teachers for storage of food and supplies.

The next proposed project is to control pigeons by using decoys and environmental modification.

Cost Benefits

There was an initial cost for permanent modifications to the buildings, such as window screens and sealing holes that could become entry points for various pests. Repairs and modifications, in the long run, will save money for the District by preventing a recurrence of costly infestation.

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Oregon

Spencer Butte Middle School, Eugene Public School District

By Holly Knight, *Northwest Coalition for Alternatives to Pesticides*

Catalyst for Change

In November 2001, an environmental education group and the Northwest Coalition for Alternatives to Pesticides (NCAP) began coordinating a naturescaping project at Spencer Butte Middle School in Eugene, Oregon. The project involved 5,500 square feet to work with, no money for plants, no budget to hire a landscape designer, a potentially uneasy relationship with the District and an accelerated time line. The goal was to transform the "courtyard" (an enclosed space with grass, four non-native trees, and a broken asphalt path right through the middle) into a habitat for wildlife and an outdoor classroom.

Implementation Strategies

It began with recruiting a landscape designer from the City of Eugene, securing a grant from the Soil and Water Conservation District (SWCD) and enlisting the help of a number of public employees and private businesses. The first step was to meet with District personnel. A steering committee was assembled, composed of the school principal, the teacher whose seventh grade class would take responsibility for the project, two District supervisors and the project coordinator, Holly Knight. Involving the students in the planning process was a main goal.

Botanists, agency personnel from the City and SWCD and the project coordinator met to recommend to the steering committee site-preparation methods, as well as plants that would not be dependent on pesticide use, would attract native wildlife and be drought-tolerant.

In December, volunteer adults jack hammered the asphalt path and stripped the top layer of sod. At the next five work parties, students, and parents wheelbarrowed the sod and asphalt to a large drop box destined for the dump, covered the newly exposed soil with cardboard, added three to four inches of compost, and then spread on at least two inches of leaves.

A parent was successful in recruiting a landscape architect from the City who was willing to lead two design sessions and draw up plans. At the first session, students drew general plans (e.g., a pond here, trees there, etc.), after which the architect drafted a proposal that designated placement of unidentified trees, shrubs, and perennials, as well as other features. The District reviewed the proposal, checking it against their maps of underground pipes and utility lines. At the final design session, students consulted gardening books and suggested specific plants.

With the District's approval, a grant proposal was submitted to SWCD for plants, gravel, and an irrigation system. Then, students marked and labeled the spot for each plant, learned how to plant properly, and dug holes for larger trees. In May, a high school work crew put in gravel paths. In June, a local irrigation specialist helped to put in a drip irrigation system. In fall 2002, benches were installed and the next crop of seventh graders and parents planted bulbs.

IPM Effectiveness

By March 2002, before all the plants were in the ground, a pair of killdeer established two nests and raised four young in the courtyard. The school now has an outdoor classroom, area wildlife have additional habitat, and the success of the interactions with the District will pave the way for similar projects.

Keys to Success

The support of the principal, which was unwavering, and the fact that the coordinator was paid enabled the team to work. Success is due to the participation of volunteers — from parents and students to agency personnel and interns.

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Texas

Irving Independent School District

By Marty Reiner, *Texans for Alternatives to Pesticides*

Catalyst for Change

The impetus for introducing IPM to control pests and weeds in the Irving Independent School District (Irving ISD) resulted from efforts of the director of facilities the passage in 1991 of the *Texas Structural Pest Control Act*, which required the adoption of IPM programs in Texas public schools after 1995. The approach to IPM in Irving ISD, a community north of Dallas with 30,000 students and nearly 4,000 teachers and staff, is "to be able to control pests in such a way so as to reduce any potential health hazards to employees, students, and the public, but still be able to control structural and landscape pests which interfere with the day to day operation of [the] schools." The District is comprised of 45 buildings, 4.4 million square feet, and 466 landscaped acres.

Per the state law, IPM focuses on eliminating pests while reducing the use of chemicals. Standards were established for the use of insecticides, herbicides, and other chemical agents to control pests, rodents, insects, and weeds in school buildings and other facilities of school districts. Requirements were established directing the use of least toxic methods available to control pests, with lists of allowable products.

After several students in the Irving ISD had severe reactions to chemicals, the District wanted to provide as "clean" an environment as possible. The main problems confronting the District were mice, rats, roaches, weeds, and ants. The program had to overcome an attitude of "just spray it" from teachers and administrators.

Implementation Strategies

Part of the change came from new design, grading, and landscaping to prevent ponding of water and excluding nesting and breeding areas. Using proper mowing heights controls weeds. Classrooms are kept free of food and all food storage and service areas are properly cleaned. Stinging insects are controlled by preventing their access to buildings. Sources of attractants for wasps (e.g., trashcans, food, soda cans) have been removed.

Pesticides are now used only when it is determined that non-toxic methods are failing and a health hazard exists. When pesticides are used, notice is posted on the school bulletin board at least 48 hours prior to treatment. Parental involvement comes via meetings with the principal, usually through the PTA. In addition, the IPM coordinator has made several presentations to the PTA.

By paying attention to the sources of problems as well as the means of attacking the problems, Irving ISD has operated a successful IPM program for a number of years. Food is kept sealed and the floors kept clean. No one other than the IPM coordinator for the District is allowed to make IPM-based decisions.

The biggest problems facing the District have been with ants and rodents. And a big challenge has been re-educating the public about the efficacy of alternative approaches to pest management. Written plans are in place and principals are trained once a year. Custodial and maintenance personnel are trained every six months using Texas A&M extension service personnel and materials. The District's budget for pesticides and their application is $60,000 annually out of an annual operating budget of $19,000,000 for facility maintenance. Initial financial support for IPM came from reallocating budget dollars.

Key to Success

Streamlining the communications/decision-making process was fundamental when first implementing IPM. Only one person, the assistant director of security and operations, makes decisions and directs the IPM program.

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Vermont

South Burlington School District

By Susanne Miller, *Vermont Public Interest Research Group*

Photo by Jason Malinsky

Catalyst for Change

In 2000, South Burlington was facing a drought that resulted in an influx of ants and bees, and a concern among school custodians about the impact that chemical pesticides, if used, would have on South Burlington's wetland environment and children's health.

During that year, at a school safety committee meeting attended by administrators, nurses, nutrition services, custodians and other staff, custodians voiced their concerns about the best and most appropriate approach to pest control. They mentioned that they felt that the District should take an approach that would have the least negative impact on the local wetland environment and the most positive impact in reducing health risks for children and the visiting public. They wanted to know what they could do to avoid using chemicals or to only use them as a last resort.

In 2001, in response to these concerns, the South Burlington School District (SBSD) created a written "Pesticide Protocol" for the use of pesticides in schools. They began implementing an IPM program, and contracted with a local pest control operator licensed by the state of Vermont to handle any "last resort" pesticide applications.

According to Marilyn Frederick, South Burlington School's business manager, "Our pesticide protocol was a direct product of our school custodians and their desire to minimize the use of pesticides. Our custodians are more than just janitors or cleaners of school buildings, they are true custodians of our campuses and really care about what is and isn't good for our kids and community."

Implementation Strategies

South Burlington's written pesticide protocol specifies that the District reduce the use of pesticides in schools and employ alternative pest management strategies or IPM. Specifically, the protocol suggests using IPM strategies, such as making structural changes to buildings and improving sanitation. It states that when pesticides are needed, "The least toxic chemical controls that will be effective [should] be used." Moreover, the protocol ensures that records like Material Safety Data Sheets (MSDS) and labels are kept on school premises, and that signs be posted before applications take place and remain on site, for an unspecified amount of time, after pesticides are applied. Finally, the protocol suggests that pesticides only be applied when students are not present — preferably over the weekend or holidays, and that treated surfaces inside classrooms be dry before students are allowed to return.

"We felt that the best way to combat pests in South Burlington was to avoid having pests in the first place," said Ms. Frederick. "As soon as we created our pesticide use policy, we began taking preventive steps. We put screens on our doors, sealed cracks, and moved items that might attract insects and animals such as dumpsters away from the school building."

Since the written policy was created, South Burlington's custodians have educated other staff and students on methods to reduce pest problems in their school. Their dedication to protecting both the schools and its inhabitants, is leading to a safer and healthier school environment

Cost Benefits

Ms. Frederick says that the cost of IPM strategies at SBSD has not increased the cost of pest management much if at all. Since the schools have made structural changes to keep the pests out, they have not had huge pest problems. If pest problems do occur, a contract pest control operator, who only uses pesticides if non-chemical alternatives fail, is called.

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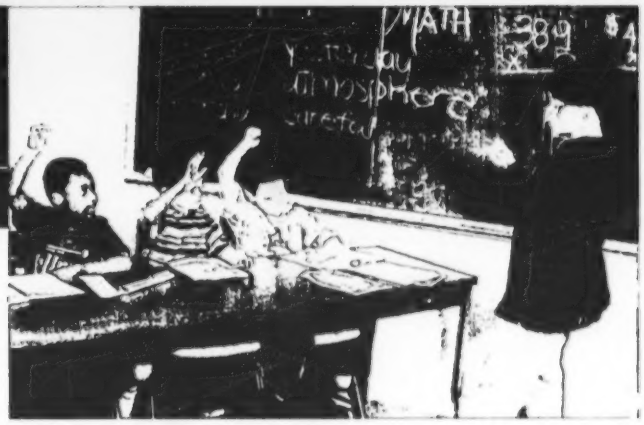
Virginia

Montgomery County Public Schools

By Julie Jones, *Virginia Health and Environment Project*



Catalyst for Change

Montgomery County Public Schools, which serves over 9,000 students, grades K-12, in over 20 school buildings, totaling over two million square feet, voluntarily adopted an IPM program. In the spring of 2000, Lou Ferguson, the engineer for the school system who oversees the District's pest control contracts, pioneered an effort to implement IPM. He designed the program and negotiated a contract with a local pest control company.

Implementation Strategies

Mr. Ferguson's IPM program, based in part, on Florida's voluntary school IPM guidelines and the work of the Virginia's Urban Pest Specialist, has been a great success. It has greatly reduced the use of sprayed pesticides and the possibility of student exposure, created an accessible source of information on pesticide use for school officials, better involved school custodians in pest control and created a standard pest control plan for all schools.

"Monitor, monitor, monitor," says Mr. Ferguson. The entire program is based on monitoring for pests and addressing *specific* problems, beginning with a comprehensive inspection of each facility to identify areas, particularly in the cafeteria and kitchen, which need monthly monitoring.

The IPM plan places a premium on communication. Mr. Ferguson acts as the central district IPM manager, and serves as the authority for pest control in every facility. The senior custodians in each school are his eyes and ears and the point of contact for the hired pest control operators.

The IPM plan stresses thorough documentation. Each school has a large three ring binder that includes the following:

- **The IPM Plan** including instructions for monitoring, allowable pesticides (primarily baits and dusts), and guidelines for getting approval from the IPM manager to apply pesticides to a documented pest program;
- All of the required **records of license**;
- **Material Safety Data Sheets (MSDS)** for allowed chemicals;
- **The pest control contractor's schedule** for servicing the building;
- **A floor plan of the entire facility** and detailed floor plans of the kitchen area, with the locations of monitoring stations; and,
- **Quality control forms** comprising an ongoing list of all documented pest problems. In the event that the IPM manager gives permission to use a pesticide, the contractor must record the quantity, location, and chemical content.

The primary differences between the old contract and the new IPM contract are communication, support, and accountability. Under the old system, school custodians, officials, teachers, and parents were not informed on what and how much chemical was applied in the school and whether there really was a pest problem. Now the pest control technician and custodian remain in regular contact and the District IPM manager oversees pest control in each school. Under the new system, anyone can easily access documents describing both the nature of pest problems and the treatment methods.

Cost Benefits

The IPM program costs the school $32 a building per month, or an increase of $10 per month over the old contract. Included in the $32 is the cost of the initial inspection of each facility — a time consuming process. After the initial inspection, the technician's monthly service visits typically take no longer than the traditional service of prophylactic spraying.

Not including the cost of the initial full building inspections in the regular monitoring, the cost of the monthly service contract is reduced.

Keys to Success

Communication, support, and accountability are the central ingredients for the successful administration of an IPM program.

Contact: Julie Jones, executive director, Virginia Health and Environment Project, P.O. Box 1434, Charlottesville VA 22902, (434) 242-6344, jjones@CleanVa.org, www.cleanva.org.

Washington

Bainbridge Island School District

By Erika Schreder, *Washington Toxics Coalition*

Catalyst for Change

In 1993, many students and teachers in a Bainbridge Island elementary school became ill, with symptoms including nosebleeds, rashes, increased asthma, and headaches, during a renovation in which a toxic solvent was used to remove tiles. Some students and teachers are still experiencing some of these symptoms.

Since that time, the Bainbridge Island School District, parents, and community members have made environmental health a priority when designing, building, and maintaining schools and school grounds. In 1994, the Association of Bainbridge Communities (ABC) asked the school board to provide them with information on pesticide use in the District and discovered that pesticides were being used with few protections for children's health or the environment. For example, pesticides were used while children were present. Parent Karen Ahern said, "Most parents assume that poisonous things wouldn't be used in schools. There were no rules for less-toxic materials, and no laws related to keeping dangerous pesticides away from children, so we had take action locally to protect our own backyard."

To address this problem, the District joined the Washington Toxics Coalition (WTC) Model Schools Program in 1996. School District administrators, groundskeepers, maintenance staff, parents, and representatives of ABC, EPA, and WTC formed an IPM Committee to develop a policy, which was adopted later that year. The committee also collected information on the District's most-serious pest problems and researched least-toxic solutions. The parents and community members involved built community support by informing the media, doing presentations at schools and elsewhere, and publishing newsletter articles.

Implementation Strategies

The first step was to dispose of the District's inventory of pesticides. The District stepped up its efforts to prevent pest problems, and if they occur it relies almost exclusively on physical methods or least-toxic products. For example, when wasp or yellow jacket nests become problematic, staff remove them manually if it is cool enough that the insects are not active, or they use a mint-oil product.

To deal with indoor insect problems, the District contracts with a biologically based company called Extermination Services. They focus on finding the root of the problem and creating long-term solutions such as blocking entry points. They have also used biological controls as well as least-toxic chemicals, such as nematodes to address termites and applying a mixture of boric acid and diatomaceous earth to control carpenter ants.

Bainbridge's first pesticide-free school was Woodward Middle School, which was designated pesticide-free when it was built because of its proximity to a Coho salmon stream. The biggest challenge that grounds staff have faced at Woodward is maintaining the track, which tends to develop weeds when it is not used heavily enough to prevent them. To address this problem, the District purchased new equipment that uproots the weeds.

The staff is working toward a long-term solution that includes using native plantings and making sure new landscapes are designed with an eye toward reduced maintenance. At Sakai Elementary School, high-maintenance areas such as thinly planted shrub beds are minimized.

Keys to Success

Jack Evans, the District's maintenance foreman, cites community support as the number-one reason that their program has been successful. "When word got out on what we were doing, there was more support from the community than most people had imagined," he said. He also advises other districts that are adopting IPM programs to use organizations like WTC and resources within the community to develop a committee.

Contact: Angela Storey, pesticides organizer, Washington Toxics Coalition, 4649 Sunnyside Avenue North, Suite 540E, Seattle WA 98103, 206-632-1545 ext 11, astorey@watoxics.org, www.watoxics.org.

Washington

Carl Sandburg Elementary School, Lake Washington School District

By Austin Walters, *Washington Toxics Coalition*

Catalyst for Change

At Carl Sandburg Elementary School in the Lake Washington School District, parent Jill Albinger found that the District had sprayed 60 gallons of herbicides in July of 1999 shortly before students returned from summer vacation. She decided to take action to protect her son and his schoolmates, thus beginning a very simple and successful herbicide-free program.

Implementation Strategies

Ms. Albinger began by proposing an arrangement that would give her primary responsibility for grounds keeping, with the help of volunteers and work parties. The principal and assistant superintendent agreed to let Ms. Albinger try it for one year on the condition that she maintain the landscape to the existing standards.

Through site assessments, the help of professional landscaper and Sandburg parent E. J. Hook, and the Washington Toxics Coalition (WTC), they were able to develop a successful program. They started by establishing a maintenance and improvement plan to eliminate the need for any herbicide treatments and reduce the amount of staff time needed to control problems.

Successful tactics used at Sandburg include hand pulling, flame weeding, mulching, cementing weed-laden cracks in the hard surfaces, and raising fence lines. Hand pulling can be done by individual volunteers at their convenience, or in large organized groups during work parties. Flame weeding works well as a maintenance tool for hard-to-reach areas on the edges of portable classrooms, in sidewalk cracks, and in gravel areas.

Mulching has been a primary tool for shrub beds. Areas were weeded, then treated with corn gluten to prevent weed germination, and then covered with a dense layer of wood chip mulch. By raising the fence just a few inches off the ground, it is much easier to control weeds using a string trimmer. The perennial problem of weeds in sidewalk cracks was addressed by sealing sidewalk cracks and seams.

Ms. Albinger and the volunteers also worked to maintain a butterfly garden, which was planted densely to suppress weeds and encourage beneficial insects. This garden is managed by students during the year and is used as a teaching tool by the staff.

The main challenges in this project were recruiting volunteers and getting support from the school staff and parents. While the school administration supported Ms. Albinger's efforts, the school still uses pesticides to deal with indoor pests. Ms. Albinger continues to try to get District support to expand the herbicide-free program to the entire District. Mr. Hook is hopeful that District staff will take over more maintenance responsibilities at the school.

Cost Benefits

In the beginning, the school agreed to give the herbicide-free project $165, which was approximately the amount the District had spent to purchase herbicides and pay for the labor to spray. In addition, Ms. Albinger received funds from the District and from PTA groups. She used the start-up money to buy the flame weeder, the propane needed to operate the machine, and a corn-gluten product to suppress weeds in beds and below mulched areas. Now the program only requires minimal funds to purchase corn gluten, tools for volunteers, and propane for the flame weeder. Overall, the herbicide-free project was simple and inexpensive to introduce and is now almost free to maintain.

Key to Success

Research and initial training from knowledgeable people is critical. Ms. Albinger feels that she would have struggled more without the help of the WTC and Mr. Hook's professional advice.

Contact: Angela Storey, pesticides organizer, Washington Toxics Coalition, 4649 Sunnyside Avenue North, Suite 540E, Seattle WA 98103, 206-632-1545 ext 11, astorey@watoxics.org, www.watoxics.org.

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Appendix A

How-to get your school to adopt an IPM program

Photo by Jason Malinsky

As the 27 case studies illustrate, school community members and activists, school policy decision makers, and school pest management practitioners all play vital roles in the adoption of an effective IPM program. Important lessons can be learned through the successes and challenges these stories describe. Take this information to advocate for a school IPM program or to improve the existing program.

Changing a school's pest management program requires perseverance. Since pest control is not often a large part of the school's budget, many administrators do not consider it a focus and are likely to be uninformed about their school's policy and any available alternatives. Work with your school to stop using hazardous pesticides and adopt alternative practices that have been adopted in the schools highlighted in this report. While the alternatives are being put in place, ask the school to provide staff and parents with prior notice before pesticides are used.

Since pest control is not often a large part of the school's budget, many administrators do not consider it a focus and are likely to be uninformed about their school's policy and any available alternatives.

Beyond Pesticides and state and local organizations can provide you with the resources necessary for developing, adopting, and implementing a school IPM program. Whether you are a parent, community activist, pest manager/pest control operator, or school administrator or employee, the following outlines the steps leading to the adoption of a successful school IPM program. The organizations listed in Appendix B can provide assistance throughout the process. If an organization is not listed in your state, please contact Beyond Pesticides.

Identify the School's Pest Management Policy

The first step is to identify whether there are applicable state and local policies concerning school pesticide use and/or IPM and to find out who administers the pest control program — the school, the school system or a contractor. Contact the appropriate school personnel to find out if and how the applicable policies are being implemented by identifying what pest management controls the school is using, the pesticides used, and the notification program.

Educate Yourself and Evaluate the Program

Gather information on the hazards of pesticide exposure and the increased susceptibility of children to the health effects of pesticides. Learn about IPM and what alternatives to chemical pest control methods are available. Identify additional steps that the school should be taking to protect children from pesticides and implement a successful IPM program.

Organize the School Community

Identify and contact friends and neighbors, individuals, and organizations who care about or are affected by school pesticide use, including parents, students, teachers, school staff and board members, unions, doctors, environmentalists, local PTAs, outdoor clubs, and religious institutions. Develop and present a proposed IPM policy (see www.beyondpesticides.org/schools for a model policy) for adoption by the school or school district. PTA meetings are an excellent forum to arouse interest and encourage parents, teachers, and students to develop a pilot IPM project in their school (see Appendix C for the National PTA's resolution on school pesticide use and IPM). Create a district-wide workshop for pest managers, discussing IPM strategies and methods.

Work with School Decision-Makers

Contact the appropriate school official(s) and ask for an endorsement and passage of the proposed IPM policy. Provide them with information on the hazards of the chemicals currently being used and on safer alternative strategies. It is important that an IPM program include a written policy adopted by the school district's board. This will ensure the program is institutionalized and will not revert back to a conventional program after the key activists, parent or school staff person leave the district.

The same individuals, organizations, and staff members that were instrumental in getting the school to adopt the policy must also watchdog the school to make sure it is successfully implemented.

Become a Watchdog and Establish an IPM Committee

Make sure the school district is on track to improve its practices. The same individuals, organizations, and staff members that were instrumental in getting the school to adopt the policy must also watchdog the school to make sure it is successfully implemented. Creating an IPM committee to oversee the program can be one way to ensure program implementation. Committee members should include parents, students (if age appropriate), teachers, school administrators, facilities, food service and landscape staff, any pest control company contracted by the school, and community environmental and public health organizations. The committee's main purpose is to assist with the development of implementation guidelines and recommend non-toxic and least hazardous strategies for pest management.

Appendix B
School IPM contacts

Network with others that have been successful with school IPM issues. The following is a list of organizations, pest management companies, and government and school contacts that can provide a wealth of information on adopting a school IPM policy and its implementation.

State and Local Organizations

Alaska

Alaska Community Action on Toxics
505 West Northern Lights Blvd,
Suite 205
Anchorage AK 99503
907-222-7714
info@akaction.net
www.akaction.net

California

Environment California
3486 Mission Street
San Francisco CA 94110
415-206-9338
info@environmentcalifornia.org
www.environmentcalifornia.org

Californians for Pesticide Reform
49 Powell Street, #530
San Francisco CA 94102
415-981-3939
pests@irg.org
www.pesticidereform.org

Connecticut

Environment and Human Health
1191 Ridge Road
North Haven CT 06473
203-248-6582
info@ehhi.org
www.ehhi.org

Florida

Legal Environmental Assistance Foundation
1114 Thomasville Road, Suite E
Tallahassee FL 32303-6288
850-681-2591
jzokovitch@leaflaw.org
www.leaflaw.org

Hawaii

Hawaii Coalition for Alternatives to Pesticides
PO Box 536
Hanalei HI 96714
808-826-5150

Illinois

Safer Pest Control Project
25 E. Washington Street, #1515
Chicago IL 60602
312-641-5575
jdick@bpichicago.org
www.spcpweb.org

Indiana

Improving Kids' Environment
5244 Carrollton Ave.
Indianapolis IN 46220
317-442-3973
neltner@ikecoalition.org
www.ikecoalition.org

Louisiana

Louisiana Environmental Action Network
PO Box 66323
Baton Rouge LA 70896
225-928-1315
lean@leanweb.org
www.leanweb.org

Maine

Maine Toxics Action Coalition
643 Brown's Point Road
Bowdoinham ME 04008
207-666-3598
kmcgee@gwi.net

Maryland

Maryland Pesticide Network
544 Epping Forest Road
Annapolis MD 21401
410-849-3909
info@mdpestnet.org
www.mdpestnet.org

Massachusetts

Toxics Action Center
29 Temple Place
Boston MA 02111
617-292-4821
sayers@toxicsaction.org
www.toxicsaction.org

Michigan

Local Motion
343 South Main Street, Suite 206
Ann Arbor MI 48104
(734) 623-0773
kjwebber@local-motion.org
www.local-motion.org

Minnesota

Minnesota Children's Health Environment Coalition
Kids for Saving the Earth
5425 Pineview Lane
Plymouth MN 55442
763-559-1234
kscww@aol.com
www.kidsforsavingearth.org
www.checnet.org/mnchec.htm

Mississippi

Mississippi 2020 Network
Box 13506
Jackson MS 39236
601-969-2902
info@mississippi2020.org
http://www.mississippi2020.org

New Hampshire

Jordan Institute
18 Low Avenue
Concord NH 03301
603-226-1009
info@thejordaninstitute.org
www.thejordaninstitute.org

New Jersey

New Jersey Environmental Federation
223 Park Avenue
Marlton NJ 08053
856-767-5040
janogaki@cleanwater.org
www.cleanwater.org/njef

New York

New York Coalition for Alternatives to Pesticides
353 Hamilton Street
Albany NY 12210
518-426-8246
nycap@crisny.org
www.crisny.org/not-for-profit/nycap/nycap.htm

North Carolina

Agricultural Resources Center
206 New Bern Place
Raleigh NC 27601
919-833-5333
pested@envirolink.org
http://www.ibiblio.org/arc

Oregon

Northwest Coalition for Alternatives to Pesticides
PO Box 1393
Eugene OR 97440-1393
541-344-5044
info@pesticide.org
www.pesticide.org

Pennsylvania

Pennsylvania Clean Water Action
33 East Abington Avenue
Philadelphia PA 19118
215-640-8800
bwendelgass@cleanwater.org
www.cleanwater.org/pa/index/htm

Texas

Texans for Alternatives to Pesticides
3015 Richmond, Ste 270
Houston TX 77098
713-523-2827
nopesticides@hotmail.com
www.nopesticides.org

Vermont

Vermont Public Interest Research Group
141 Main Street
Montpelier VT 05602
802-223-5221
info@vpirg.org
www.vpirg.org

Virginia

Virginia Health and Environment Project
P.O. Box 1434
Charlottesville VA 22902
434-242-6344
info@cleanva.org
www.cleanva.org

Washington

Washington Toxics Coalition
4649 Sunnyside Ave N, Ste 540E
Seattle WA 98103
206-632-1545
info@watoxics.org
www.watoxics.org

National Organizations

Beyond Pesticides
701 E Street, S.E.
Washington DC 20003
202-543-5450
info@beyondpesticides.org
www.beyondpesticides.org

Child Proofing Our Communities Campaign
Center for Health, Environment and Justice
PO Box 6806
Falls Church VA 22040
703-237-2249
childproofing@chej.org
www.childproofing.org

Healthy Schools Network, Inc.
773 Madison Avenue
Albany NY 12208
518-462-0632
healthyschools@aol.com
www.healthyschools.org

IPM Institute of North America
1914 Rowley Avenue
Madison WI 53705
608-232-1528
ipmworks@ipminstitute.org
www.ipminstitute.org

School IPM Companies, State Officials, and Consultants

The *Safety Source for Pest Management: A National Directory of Least-toxic Service Providers* at www.beyondpesticides.org/safetysource provides a list of pest management companies that practice IPM. Companies are listed in the *Safety Source for Pest Management* because they have completed the Beyond Pesticides survey and indicate that they use one or more practices and/or materials that Beyond Pesticides categorizes as "non-toxic" or "least-toxic." Included in the directory are the companies' survey responses in their own words. Many of the companies in the directory operate businesses that Beyond Pesticides consider "mixed operations" because they may also use products that are classified as "toxic." As a customer, it is important to talk with the service provider about the products that they use, learn about their potential to cause adverse effects, and decide what makes the most sense for the situation needing management. Those that are referenced in the case studies in *Safer Schools* are in most cases identified on *Safety Source for Pest Management*. Search on the state or service category to find the companies that provide IPM services for schools.

See below for a list of state officials and consultants knowledgeable about implementing successful school IPM programs.

Robert M. Corrigan
RMC Pest Management Consulting
5114 Turner Rd.
Richmond IN 47374
RCorr22@aol.com
765-939-2829

William Currie
International Pest Management Institute
275 South 3rd Street, #312
Burbank, CA 91502
818-843-8304
bugebill@earthlink.net

Bio-Integral Resource Center
PO Box 7414
Berkeley CA 94707
510-524-2567
birc@igc.org
www.birc.org

Al Fournier
Purdue University
School IPM Technical Resource Center
1158 Smith Hall
West Lafayette IN 47907
765-496-7520
al_fournier@entm.purdue.edu
www.entm.purdue.edu/entomology/outreach/schoolipm/

Fudd Graham
Auburn University
Department of Entomology & Plant Pathology
301 Funchess Hall
Auburn
University AL 36849-5413
334-844-2563
fgraham@acesag.auburn.edu

Janet Hurley
Texas A&M Extension
SW Technical Resource Center
School IPM
17360 Coit Road
Dallas TX 75252-6599
972-952-9213
ja-hurley@tamu.edu
http://schoolipm.tamu.edu

Jerry Jochim
IPM Coordinator
Monroe County Community School Corporation
560 E Miller Drive
Bloomington IN 47401
812-330-7720
jjochim@mccsc.edu
www.mccsc.edu/~jjochim/ipm.html

Marc Lame
Indiana University
School of Public & Environmental Affairs
1315 E. 10th, Room 240
Bloomington IN 47405
812-855-7874
mlame@indiana.edu

Carl Martin
Arizona Structural Pest Control Commission
9535 East Doubletree Ranch Road
Scottsdale AZ 85258-5514
602-255-3664 ext. 2272
cjmartin@sb.state.az.us

Ed Rajotte
IDM Coordinator
Penn State University
501 ASI
University Park, PA 16801
814-863-4641
egrajotte@psu.edu
http://paipm.cas.psu.edu

Kirk Smith
University of Arizona
Maricopa Agricultural Center
37860 W. Smith-Enke Road
Maricopa AZ 85239
520-568-2273
cpt-kirk@ag.arizona.edu

Appendix C
National PTA IPM resolution

National PTA®

National Parents and Teachers Association
The Use of Pesticides In Schools and Child Care Centers
(Adopted by the 1992 Board of Directors)

Americans use hundreds of millions of pounds of pesticides, herbicides (plant killers), and fungicides each year, for non-agricultural purposes, including in and around schools and child care centers. Pesticides are, by nature, poisons, and exposure — even at low levels — may cause adverse health effects. Our nation's children, because of a variety of age-related factors, are at increased risk of cancer, neuro-behavioral impairment, and other health problems as a result of their exposure to pesticides. The National PTA is particularly concerned about the use of pesticides in and around schools and child care centers because children are there for much of their young lives.

The National PTA, long an advocate for a healthy environment, supports efforts:

- at the federal, state, and local levels, to eliminate the environmental health hazards caused by pesticide use in and around schools and child care centers. These efforts will result in cost-savings when use of chemicals controls is reduced; decreased health risks; and safer school and child care center environments.
- to encourage the integrated pest management approach to managing pests and the environment in schools and child care centers. Expansion of integrated pest management policies in schools and child care centers is an excellent long-term solution for control of pests that will significantly lower children's exposure to harmful chemicals by using the least hazardous mix of pest control strategies.
- to retain authority for governmental bodies, at the state and local levels, to regulate the use of pesticides in and around school and child care center buildings. This authority is critical to retaining maximum state and local control over an issue so basic to children's health and well-being.

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Appendix D

List of states and school districts that have an IPM/pesticide policy

U.S. School Districts' Pesticide Policy

Districts Covered by State Laws and Voluntary Policies and Programs that Go Beyond State Laws[1]	*IPM*	*Prior Notice*	*Posting*	*Use Restrictions*
ALABAMA (no state law)				
Auburn City Schools	V			
Prichard School District	V			
ALASKA (53 school districts covered by state law)		X	X	X
Anchorage School District	V	E	E	E
Fairbanks North Star Borough School District	V			
ARIZONA (222 school districts covered by state law)		X	X	
Crown Point Community School, Navajo Indian Reservation	N			
Dragonfleye Charter School	V			V
Kyrene School District	V			
Lake Valley School, Navajo Indian Reservation	N			
Mariano Lake School, Navajo Indian Reservation	N			
CALIFORNIA (989 school districts covered by state law)	R	X	X	
Arcata School District	V			V
Alameda School District	V			V
Capistrano Unified School District	V			
Fremont Unified School District	N			
Fresno Unified School District	V			
Larkspur School District	V		E	V
Los Angles Unified School District	V	E	E	V
Mendocino Unified School District	V			
Nevada County Schools	V		E	V
Novato Unified School District	V			V
Oakland Unified School District	V			V
Oxnard Union High School District	V			
Peabody Charter School, Santa Barbara School District	N			
Pine Tree School, Canyon County School District	V			
Placer Hills Unified School District	N			
San Bernardino City Unified School District	V			
San Diego Unified School District	V			
San Francisco Unified School District	V	E	E	V
San Jose Unified School District	V			
Santa Ana Unified School District	V			
Sacramento City Unified School District	V			
Ventura Unified School District	V	E		V
Vista de las Cruces, Santa Barbara School District	N			
COLORADO (176 school districts covered by state law)			X	
Boulder Valley School District	N			
CONNECTICUT (167 school districts covered by state law)	R	X	X	X
John Read Middle School	V			
FLORIDA (67 school districts covered by state law)	X		X	
Brevard County Public Schools		V		V

U.S. School Districts' Pesticide Policy

Districts Covered by State Laws and Voluntary Policies and Programs that Go Beyond State Laws[1]	*IPM*	*Prior Notice*	*Posting*	*Use Restrictions*
GEORGIA (183 school districts covered by state law)			X	
DeKalb County Schools	N			
ILLINOIS (896 school districts covered by state law)	X	X	X	
INDIANA (289 school districts covered by state law)			X	
253 districts adopted IN model policy[2]	V	V		
IOWA (376 school districts covered by state law)			X	
Cedar Falls Community Schools	V	V		V
Davenport Community Schools	V	V		
Lewis Central Schools	V	V		
Sioux Central Community Schools	V	V		
Woodward-Granger Community Schools	V	V		
KANSAS (no state law)				
Altamont Grade School, Unified School District 506				V
KENTUCKY (176 school districts covered by state law)	X	X	X	
LOUISIANA (66 school districts covered by state law)	X	X		X
MAINE (298 school districts covered by state law)	X	X	X	
Five Town Community School District		E		
MARYLAND (24 school districts covered by state law)	X	X	X	
Lime Kiln Middle School, Howard County Public Schools				N
St. Mary's County Public Schools			E	E
Triadelphia Ridge Elementary School, Howard County Public Schools				N
MASSACHUSETTS (303 school districts covered by state law)	X	X	X	X
MICHIGAN (169 school districts covered by state law)	X	X	X	X
Allendale Public Schools	N[3]			N[3]
Ann Arbor Public Schools				E
Bangor Public Schools	N[3]			N[3]
Birmingham Public Schools	N[3]			N[3]
Coopersville Area Public Schools	N[3]			N[3]
Detroit Cass Tech. H.S., Detroit Public Schools	N[3]			N[3]
East Jordan Public Schools	N[3]			N[3]
Emerson Elem., Saginaw Public Schools	N[3]			N[3]
Fremont Public Schools	N[3]			N[3]
Fruitport Community Schools	N[3]			N[3]
Godwin Heights Public Schools	N[3]			N[3]
Grand Haven Area Public Schools	N[3]			N[3]
Grand Rapids Public Schools	N[3]			N[3]
Greenville Public Schools	N[3]			N[3]
Harbor Springs Public Schools	N[3]			N[3]
Kalamazoo Public Schools	N[3]			N[3]
Muskegon Area Intermediate School District	N[3]			N[3]
Paw Paw Public Schools	N[3]			N[3]
Reeths-Puffer Schools	N[3]			N[3]
Rockford Public Schools	N[3]			N[3]
Saginaw H.S., Saginaw Public Schools	N[3]			N[3]
Saranac Community Schools	N[3]			N[3]
Shelby Public Schools	N[3]			N[3]
Sturgis Public Schools	N[3]			N[3]
Sylvan Christian School	N[3]			N[3]
Washtenaw Intermediate School District				E
Waverly Community Schools	N[3]			N[3]
West Ottawa Public Schools	N[3]			N[3]

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U.S. School Districts' Pesticide Policy

Districts Covered by State Laws and Voluntary Policies and Programs that Go Beyond State Laws[1]	*IPM*	*Prior Notice*	*Posting*	*Use Restrictions*
MINNESOTA (349 school districts covered by state law)		X		
Hopkins School District 270	V	E		
Willmar Public Schools	V		V	V
MONTANA (457 school districts covered by state law)	R		X	
NEW HAMPSHIRE (176 school districts covered by state law)			X	X[2]
NEW JERSEY (575 school districts covered by state law)	X	X	X	X
Haddonfield Schools				E
NEW MEXICO (89 school districts covered by state law)		X	X[3]	X
Albuquerque Independent School District	V			
Santa Fe Public Schools	V			E
NEW YORK (722 school districts covered by state law)	R	X	X	
Albany City School District	N			
Baldwin Union Free School District	V			V
Ballston Spa School District	V			V
Buffalo School District	V			
Fulton City School District	V			V
Great Neck Public Schools	V			V
Greenwich Central School District	V			V
Locust Valley Schools	V			
New York City Schools	V			V
North Syracuse School District	V			
Williamsville Public Schools	V			
NORTH CAROLINA (no state law)				
Chapel Hill-Carrboro City Schools	N			
Pitt County Schools	V			
OHIO (614 school districts covered by state law)			X	
Athens City Schools	V			
Beavercreek School District	N			N
Brookville Local Schools	N			N
Mad River Local Schools	N			N
Northmont City School District	N			N
Perrysburg Schools	N			N
Twin Valley Schools	N			N
Worthington City Schools	V			
Yellow Springs Schools	N			N
OREGON (no state law)				
Eugene Public Schools	V			
Portland Public Schools	V	V	V	V
PENNSYLVANIA (501 school districts covered by state law)	X	X	X	X
Central Dauphin School District				E
Philadelphia School District				E
Pittsburgh School District				E
Radnor Township School District				E
RHODE ISLAND (37 school districts covered by state law)	X	X	X	
South Carolina (no state law)				
Richland School District 2	V	V	V	
School District 5 of Lexington & Richland Counties	V			
TENNESSEE (no state law)				
Memphis City Schools	V			
Nashville Metro Public Schools	V			

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U.S. School Districts' Pesticide Policy

Districts Covered by State Laws and Voluntary Policies and Programs that Go Beyond State Laws[1]	*IPM*	*Prior Notice*	*Posting*	*Use Restrictions*
TEXAS (1040 school districts covered by state law)	X	X	X	X
UTAH (no state law)				
Granite School District	N			
VERMONT (259 school districts covered by state law)			X	
South Burlington School District	V		E	
VIRGINIA (no state law)		R	R	
Arlington County Public Schools	N			
Fairfax Public Schools	N			
Montgomery County Public Schools	N			
WASHINGTON (296 school districts covered by state law)		X	X	
Bainbridge Island School District	V		E	V
Carl Sandburg Elementary School, Lake Washington School District	V	E	E	V
Lincoln Elementary School, Olympia School District	V			V
Mercer Island School District	V			V
Oak Harbor School District	V		E	V
Olympia School District	V		E	V
Seattle School District	V		E	V
Sedro-Woolley School District No. 101	V		E	V
Shoreline School District	V			V
South Whidbey School District	V			V
Vancouver School District	V		E	V
Vashon Island School District	N			
WEST VIRGINIA (55 school districts covered by state law)	X	X		X
Cabell County Schools				E
WISCONSIN (428 school districts covered by state law)			X	
Madison Metropolitan School District	V			
Waterford Graded School District	V			
WYOMING (49 school districts covered by state law)		X	X	

X = provision in state law

R = state law recommends schools adopt provision

V = provision in school policy (voluntary)

E = school policy provision exceeds state law

N = school implementing but does not have official policy

[1] The table lists all states with a state law in one or more of four criteria and those that have some activity at the local level. The following are not listed in the table because they have neither a state law or local activity: Arkansas, Delaware, Hawaii, Idaho, Mississippi, Missouri, Nebraska, Nevada, North Dakota, Oklahoma, South Dakota, and Washington DC and the U.S. territories.

[2] The database of schools that have adopted the policy is tracked by Improving Kids Environment and can be found at http://www.ikecoalition.org/Pesticides_Schools/School_Pesticide_Status2.asp

[3] While the state law provision applies to all school districts in the state, this school /district has adopted pest management practices (without a policy) that exceeds the state law.

[4] The law states that pesticides cannot be applied "where exposure may have an adverse effect on human health." Although this language is open to interpretation, it is a stronger safety standard than contained in the *Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)*, which protects for "unreasonable adverse effects."

[5] New Mexico law requires signs to be posted for emergency pesticide applications only.

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Appendix E

Pest prevention strategies: An IPM checklist

Successful implementation of IPM is based on altering the elements that lead to pest infestations. For structural pest management, this includes modifying pests entry, food source, and habitat. For lawn and landscape management, this means maintaining the health of the soil. Schools should make all efforts to perform the following steps, taken from Beyond Pesticides' *Building Blocks: A Least-toxic Pest Management Manual*, which will result in decreased or elimination of most pest problems and prevent future outbreaks from occurring.

Entry Restrictions

Simple measures can be made to restrict the access pests can use to get into the school buildings.

- Install and repair screens on windows and doors.
- Install weather stripping around windows and doors.
- Seal off all gaps and openings between the inside and outside of buildings, i.e. caulk, paint, sheet metal, steel wool, spray foam insulation, cement or screen openings around all window frames, cables, pipes, vents, duct work, exhaust fans, utility wires, and conduits. (Priority should be made to those areas leading to and from kitchen areas, cafeterias, bathrooms, and storage.)
- Inspect incoming products for insects.
- Install screen covers over floor drains.
- Keep doors closed at all times.
- Trim vegetation (ivy, shrubs, and trees) at least one foot away from building.
- Remove clutter around the building's structure.
- Replace bark mulch with gravel or stone or keep bark mulch a minimum of one foot away from the building.
- Screen all intake and out take vents.
- Install air doors on doors accessing kitchens from outside.

Eliminate Food Source

Proper sanitation is essential in reducing the availability of food to which pests are attracted.

- Vacuum and mop regularly.
- Empty trash daily — cafeteria trash should be removed just after lunch break and at the end of the day. Trash cans should have a tight fitting lid and a plastic liner.
- Clean cafeteria tables, chairs, floors, and countertops just after lunch and again at end of the day's use.
- Make sure no dirty dishes are left in sinks, countertops, etc.
- Store pet food in pest-proof containers (tight fitting lids and made of thick plastic, glass or metal).
- Seal or refrigerate food.
- Replace decaying wood.
- Keep garbage cans and dumpsters away from doorways and other high traffic areas.
- Use heavy-duty trash bags.
- Remove garbage from dumpsters as needed to keep the lid tightly closed.
- Empty and wash out (with detergent and hot water) recycling bins daily.
- Store recycled products in bins with tight fitting lids and send them to the appropriate recycling facility at least weekly.
- Allow food and beverages in designated areas only.
- Prohibit food and beverages in classrooms.

- Do not store paper goods in same area where food and trash is kept.
- Clean food preparation and kitchen areas throughout day.
- Remove grease accumulation from ovens, stoves, and vents regularly.
- Deep clean kitchens two to three times a year.

Habitat Control

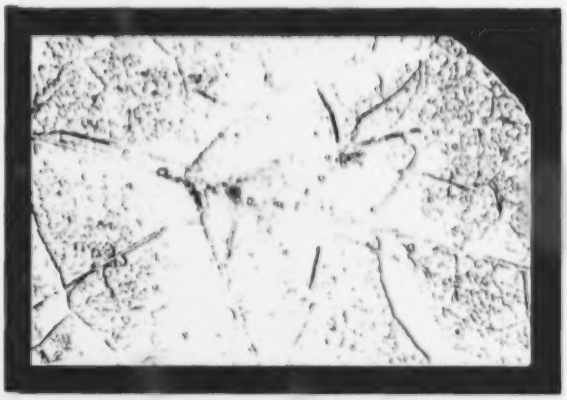
Modify the climate and living space that attracts pests.

- Repair leaking pipes and plumbing.
- Insulate hot and cold water pipes.
- Use dehumidifiers in areas of high moisture.
- Remove and replace water-damaged material.
- Clean floor drains, strainers, and grates regularly.
- Eliminate shelf paper.
- Install vapor barriers.
- Ensure adequate ventilation.
- Store food, paper products, and cardboard boxes at least 12 inches off the floor, and not touching walls or moist areas.
- Keep food and paper products in tightly sealed containers.
- Store products on metal, not wood, shelves.
- Immediately clean, dry and store mops after each use.
- Maintain adequate drainage away from buildings.
- Empty buckets of any water before storing.
- Where possible, install low-pressure sodium vapor bulbs (which emit yellow light) and direct the beams towards the building.

Lawn and Landscape Maintenance

The most vigorous lawn growth occurs in loose, loamy soils teeming with beneficial microorganisms, insects, worms, and other organisms. Landscapes should be maintained to minimize weed and insect problems.

- Plant or overseed with well-adapted, naturally pest-resistant grass varieties in the early fall.



- Reduce soil compaction by aerating the lawn two to four times per year, topdressing, and rotating mowing patterns.
- Mow dry grass high (two and a half to three inches) to encourage deep-rooted, strong grass.
- Tailor irrigation schedules to individual lawns and adjust for seasonal changes.
- Keep thatch to a minimum — less than ¾ inch.
- Apply organic fertilizers in spring and fall.
- Maintain proper soil pH. (Dandelions love soil with a pH of 7.5, while grass loves a pH of 6.7-7. Nothing will successfully conquer your dandelion problem until you correct your lawn's pH.)
- Seal cracks in sidewalks and stone walkways.
- Grow plants that attract and foster natural pest predators.
- Remove or drain any objects that hold standing water such as buckets, holes in trees, clogged gutters and down spouts, and old tires.
- Enhance the drainage of irrigation ditches and fields; keep street gutters and catch basins free of debris and flowing properly.
- Cut tall grass, weeds, and brush from around the foundation and dispose of the clippings.
- Discard fallen fruit from trees.
- Grade soil outside the building to slope away from the foundation for good water drainage.
- Minimize areas of landscape beds. Apply mulch to those areas to suppress weeds.

Endnotes

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[13] Carcinogenic pesticides are those listed by U.S. EPA as Class A, B and C carcinogens (http://epa.gov/pesticides/carlist/index.htm) and chemicals known to the state of California to cause cancer under Proposition 65 (http://www.oehha.org/prop65/prop65_list/Newlist.html).

[14] Pesticides with the highest acute toxicity are labeled by U.S. EPA as Toxicity Category I and II and bear the signal words "Danger" and "Warning."

[15] This includes pesticides that interfere with human hormones, cause birth defects or reproductive or developmental harm (http://www.pesticideinfo.org) or chemicals known to the state of California to be reproductive toxins under Proposition 65 (http://www.oehha.org/prop65/prop65_list/Newlist.html).

[16] These pesticides include, but are not limited to, organophosphates (diazinon, malathion, etc.) and pyrethroids (cyfluthrin, permethrin, etc.).

[17] According the 1996 World Resources Institute report, Pesticides and the Immune System: The Public Health Risks by Robert Repetto and Sanjay Baliga, studies document that organochlorines (lindane, chlordane, etc.), organophosphates (malathion, diazinon, etc.), carbamates (carbaryl, bendiocarb, etc.) and others (2,4-D, atrazine, captan) alter the immune system in experimental animals and make them more susceptible to disease. http://population.wri.org/pubs_description.cfm?PubID=2704.

[18] Inert ingredients that are classified by U.S. EPA as "Inert Ingredients of Toxicological Concern," "Potentially Toxic Inert Ingredients" and "Inerts of unknown toxicity" are not considered non-toxic. http://www.epa.gov/opprd001/inerts/lists.html.

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Beyond Pesticides is a nonprofit, national membership organization, founded in 1981 as the National Coalition Against the Misuse of Pesticides, to serve as a national network to provide information on the hazards of pesticides and advocate for safer alternatives not reliant on toxic chemicals. The organization's primary goal is to effect change through local action, assisting individuals and community-based organizations to stimulate discussion on the hazards of toxic pesticides, while providing information on alternatives. Beyond Pesticides publishes a quarterly news magazine, *Pesticides and You*, a monthly news bulletin, *Technical Reports*, the bi-monthly *School Pesticide Monitor*, and a web-based daily news story, *Daily News*.

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